Compton USD Learning Packet #2

Twelfth Grade

12th Grade Learning Packet

TABLE OF CONTENTS

Week 3

Day	Lesson	Date Completed
1	1) Quick Write: Describe a special trip you have always dreamed of taking. Explain how taking this trip would be a life-changing experience. 2) The Canterbury Tales is a collection of satirical tales about different pilgrims traveling to the English town of Canterbury. Please, read excerpts from the tales about the ploughman and the merchant. 3) Complete 12th Grade Week 1, Lesson 1	
	Day 1 HMH Lesson17.1 Problem Solving with Trigonometry 1) Explore- Deriving an Area Formula 2) Explain 1 and 2 answer *Reflect* and *Your Turn*	
2	1) Quickwrite: What would you do if your father was murdered by your uncle, your mother married your father's assassin, and you were put on surveillance by both? 2) Read a synopsis on Hamlet. 3) Read Hamlet's Act III, Scene III 4) Complete 12th Grade Week 1, Lesson 2.	
	Day 2 HMH Lesson17.1 Problem Solving with Trigonometry 1) Review Explain 1 and 2 answer *Reflect* and *Your Turn* 2) Complete Evaluate: Homework and Practice problems 1 - 8	
3	1) Read John Donne's poem "A Valediction: Forbidding Mourning" 2) To learn more about the carpe diem theme (or, seize the day), read the article in the british journal The Guardian. 3) Complete 12th Grade Week 1, Lesson 3	
	Introduction to Radians 1) Read through the Information sheet by *Math is Fun* about Radians. Use it as a tool to work through the lesson. 2) Complete *Radian Measure - Introduction* Activity Sheet	
4	1) Quickwrite: The poems provided contemplate the idea of a journey with a loved one. In one case, the speaker is abandoned, while on the other, one of the lovers proposes to depart together. Which of these two themes is capable of generating more pathos? Which one would move you more? 2) Read "The Love Song of Alfred Prufrock" by T.S. Eliot 3) Read "The River Merchant's Wife: A Letter" by Ezra Pound	

	Day 1 HMH Lesson 18.1 Angles of Rotation and Radian Measure 1) Explore 1 and 2: Work through the lesson and complete *Reflect* 2) Complete *Explain 1* and 2 with *Reflect* and *Your Turn*	
5	1) Quickwrite: What is "home" to you? How do you feel when you are away from the place you call "home." 2) Read an excerpt from Dreaming in Cuban by Cristina Garcia. Make sure that you are on page 152 3) Complete 12th Grade Week 1, Lesson 5.	
	Day 2 HMH Lesson 18.1 Angles of Rotation and Radian Measure 1) Review Explain 1 and 2 2) Complete Evaluate: Homework and Practice problems 1 -14	

Journeys: Going Away to Find Yourself Quick Write

Describe a special trip you have always dreamed of taking. Explain how taking this trip would be a life-changing experience.

Your answer

Submit

Excerpts from Chaucer's *The Canterbury Tales*

Document A: Ploughman excerpt from *The Canterbury Tales* by Geoffrey Chaucer

Source Note: Geoffrey Chaucer is arguably the most famous English poet and writer of the Middle Ages. He lived during the 1300s in England and wrote many poems, stories, and even scientific works. The excerpt below is from Chaucer's most well-known work, *The Canterbury Tales*. The story tells of a group of English pilgrims making their way to Canterbury and telling each other stories as they travel.

With him there was a PLOUGHMAN [farmer], was his brother,
That had y-laid of dung full many a fother [unit of weight]
A true swinker [laborer] and a good was he,
Living in peace and perfect charity.
God loved he beste with all his heart
At alle times, were it gain or smart [loss],
And then his neighebour right as himselve.
He woulde thresh, and thereto dike, and delve [dig ditches],
For Christe's sake, for every poore wight,
Withouten hire, if it lay in his might.
His tithes payed he full fair and well,
Both of his proper swink [labor], and his chattel [goods]
In a tabard [sleeveless tunic] he rode upon a mare.

Citation: Chaucer, Geoffrey. *The Canterbury Tales and Other Poems.* Project Gutenberg.

Document B: Merchant excerpt from *The Canterbury Tales* by Geoffrey Chaucer

Source Note: Geoffrey Chaucer is arguably the most famous English poet and writer of the Middle Ages. He lived during the 1300s in England and wrote many poems, stories, and even scientific works. The excerpt below is from Chaucer's most well-known work, *The Canterbury Tales*. The story tells of a group of English pilgrims making their way to Canterbury and telling each other stories as they travel.

A MERCHANT was there with a forked beard,
In motley, and high on his horse he sat,
Upon his head a Flandrish beaver hat.
His bootes clasped fair and fetisly [neatly].
His reasons aye spake he full solemnly,
Sounding alway th' increase of his winning.
He would the sea were kept for any thing
Betwixte Middleburg and Orewell
Well could he in exchange shieldes [crown coins] sell
This worthy man full well his wit beset [employed];
There wiste [knew] no wight [man] that he was in debt,
So estately [well] was he of governance [managing his business]
With his bargains, and with his chevisance [business contracts].
For sooth he was a worthy man withal,
But sooth to say, I n'ot [know not] how men him call.

Citation: Chaucer, Geoffrey. *The Canterbury Tales and Other Poems*. Project Gutenberg

12TH GRADE. WEEK 1. LESSON 1.
The Canterbury Tales by Geoffrey Chaucer

Chaucer wrote his *Canterbury Tales* in 1392, during a time when one in two Europeans were wiped out by the Black Death. In order to mitigate the effects of the bubonic plague, the causes of which were unknown, all across Europe, people turned to religion looking for relief, and pilgrimages to sacred sites proliferated. One of the most important pilgrimage sites in England was the town of Canterbury, which housed the remains of Thomas Becket, former Archbishop of Canterbury, who entered a dispute with the king Henry II and was murdered by his followers. With the excuse of the journey, Chaucer focuses on a heterogeneous group of individuals to satirize different aspects of Mediaeval society. Please, notice that *The Canterbury Tales* were written in Middle English, which represents a different stage in the evolution of the language from what we use today. If this is too challenging, there are multiple translations into modern English that you may find online.

1. The following quote from the Prologue of *The Canterbury Tales*: "Whan that Aprille with his shoures sote/ The droghte of Marche hath perced to the rote" provides evidence for which of the following ideas?
    A. It refers to the Bubonic Plague
    B. It provides a reference to the Hundred Years War
    C. It provides the setting.
    D. It explains the characters participating.
2. What inference can be made from the following lines in the *Prologue of The Canterbury Tales*: "So hadde I spoken with hem everichon,/That I was of hir felawshipe anon,/And made forward erly for to ryse,/To take our wey, ther as I yow devyse"?
    A. The author is joining the group.
    B. The narrator will join the group.
    C. The Merchant will join the group.
    D. None of the above.
3. Which is an attempt at characterization in the "Ploughman's Tale"?
    A. "God loved he beste with all his heart."
    B. "Withouten hire, if it lay in his might."
    C. "That had y-laid of dung full many a fother."
    D. "In a tabard, he rode upon a mare."
4. Which is an example of satire in the "Merchant's Tale"?
    A. "He would the sea were kept for any thing."
    B. "Sounding alway th' increase of his winning."
    C. "For sooth he was a worthy man withal"
    D. "There wiste no wight that he was in debt"
5. What differences do you observe between the "Ploughman's Tale" and the "Merchant's Tale" and what inference can you make about it?

A. In the "Ploughman's Tale" there is no evidence of irony, so it could not have been written by Chaucer.
B. In the "Merchant's Tale", there is no evidence of characterization, so it was written later.
C. In the "Ploughman's Tale", the character is too heavy to be riding a mare, so it had to be written in the 20th century.
D. In the "Merchant's Tale", the character's wife only appears twice, so she was added later.

Name _____ Class _____ Date _____

17.1 Problem Solving with Trigonometry

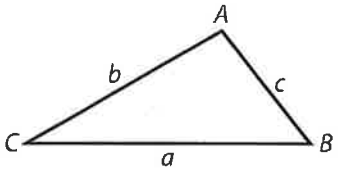
Essential Question: How can you solve a right triangle?

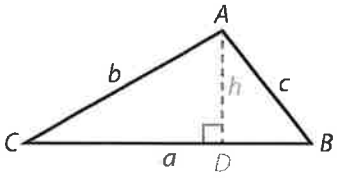
Resource Locker

Explore Deriving an Area Formula

You can use trigonometry to find the area of a triangle without knowing its height.

(A) Suppose you draw an altitude $\overline{AD}$ to side $\overline{BC}$ of $\triangle ABC$. Then write an equation using a trigonometric ratio in terms of $\angle C$, the height h of $\triangle ABC$, and the length of one of its sides.





(B) Solve your equation from Step A for h.

(C) Complete this formula for the area of $\triangle ABC$ in terms of h and another of its side lengths: Area $= \frac{1}{2}$

(D) Substitute your expression for h from Step B into your formula from Step C.

Reflect

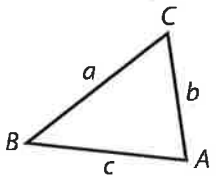
1. Does the area formula you found work if $\angle C$ is a right angle? Explain.

2. Suppose you used a trigonometric ratio in terms of $\angle B$, h, and a different side length. How would this change your findings? What does this tell you about the choice of sides and included angle?

Explain 1 Using the Area Formula

Area Formula for a Triangle in Terms of its Side Lengths

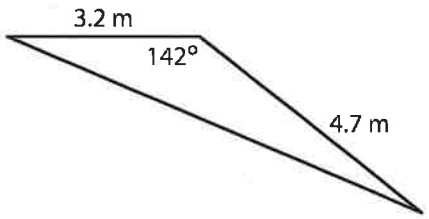
The area of $\triangle ABC$ with sides a, b, and c can be found using the lengths of two of its sides and the sine of the included angle: Area $= \frac{1}{2}bc \sin A$, Area $= \frac{1}{2}ac \sin B$, or Area $= \frac{1}{2}ab \sin C$.



You can use any form of the area formula to find the area of a triangle, given two side lengths and the measure of the included angle.

Example 1 **Find the area of each triangle to the nearest tenth.**

(A)



Let the known side lengths be a and b.	$a = 3.2$ m and $b = 4.7$ m
Let the known angle be $\angle C$.	m $\angle C = 142°$
Substitute in the formula Area $= \frac{1}{2}ab \sin C$.	Area $= \frac{1}{2}(3.2)(4.7)\sin 142°$
Evaluate, rounding to the nearest tenth.	Area ≈ 4.6 m^2

(B) In $\triangle DEF$, $DE = 9$ in., $DF = 13$ in., and $m\angle D = 57°$.

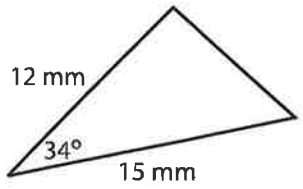
Sketch $\triangle DEF$ and check that $\angle D$ is the included angle.

Write the area formula in terms of $\triangle DEF$.	Area $= \frac{1}{2}(DE)($ $)\sin$
Substitute in the area formula.	Area $= \frac{1}{2}($ $)($ $)\sin$ °
Evaluate, rounding to the nearest tenth.	Area $\approx$ in.^{2}

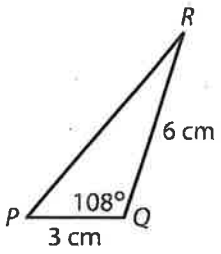
Your Turn

Find the area of each triangle to the nearest tenth.

3.



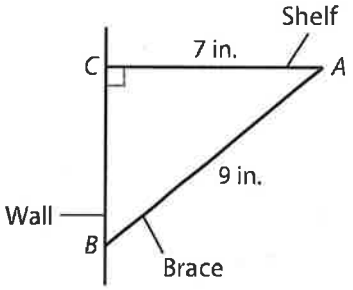
4. In $\triangle PQR$, $PQ = 3$ cm, $QR = 6$ cm, and $m\angle Q = 108°$.



Explain 2 Solving a Right Triangle

Solving a right triangle means finding the lengths of all its sides and the measures of all its angles. To solve a right triangle you need to know two side lengths or one side length and an acute angle measure. Based on the given information, choose among trigonometric ratios, inverse trigonometric ratios, and the Pythagorean Theorem to help you solve the right triangle.

A shelf extends perpendicularly 7 in. from a wall. You want to place a 9-in. brace under the shelf, as shown. To the nearest tenth of an inch, how far below the shelf will the brace be attached to the wall? To the nearest degree, what angle will the brace make with the shelf and with the wall?



(A) Find BC.

Use the Pythagorean Theorem to find the length of the third side. $AC^2 + BC^2 = AB^2$

Substitute 7 for AC and 9 for AB. $7^2 + BC^2 = 9^2$

Find the squares. $49 + BC^2 = 81$

Subtract 49 from both sides. $BC^2 = 32$

Find the square root and root. $BC \approx 5.7$

(B) Find $m\angle A$ and $m\angle B$.

Use an inverse trigonometric ratio to find $m\angle A$. You know the lengths of the adjacent side and the hypotenuse, so use the cosine ratio.

Write a cosine ratio for $\angle A$. $\cos A =$

Write an inverse cosine ratio. $m\angle A = \cos^{-1}\left(\quad\right)$

Evaluate the inverse cosine ratio and round. $m\angle A \approx$ ____°

$\angle$ ____ and $\angle B$ are complementary. $m\angle$ ____ $+ m\angle B = 90°$

Substitute ____° for $m\angle$ ____. ____° $+ m\angle B \approx 90°$

Subtract ____° from both sides. $m\angle B \approx$ ____°

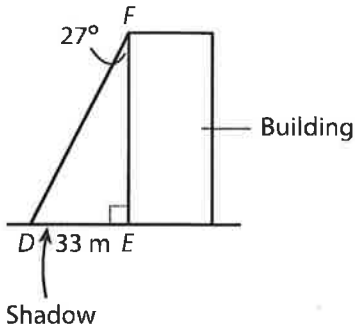
Reflect

5. Is it possible to find $m\angle B$ before you find $m\angle A$? Explain.

_____

Your Turn

A building casts a 33-m shadow when the Sun is at an angle of 27° to the vertical. How tall is the building, to the nearest meter? How far is it from the top of the building to the tip of the shadow? What angle does a ray from the Sun along the edge of the shadow make with the ground?



6. Use a trigonometric ratio to find the distance EF.

7. Use another trigonometric ratio to find the distance DF.

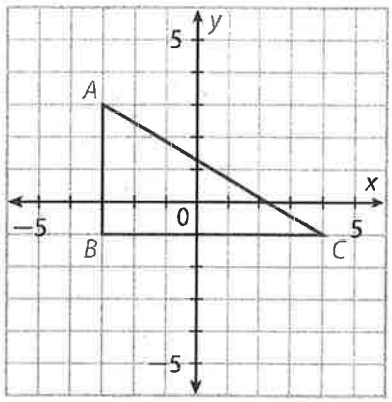
8. Use the fact that acute angles of a right triangle are complementary to find $m\angle D$.

Explain 3 Solving a Right Triangle in the Coordinate Plane

You can use the distance formula as well as trigonometric tools to solve right triangles in the coordinate plane.

Example 3 **Solve each triangle.**

(A) Triangle ABC has vertices $A(-3, 3)$, $B(-3, -1)$, and $C(4, -1)$. Find the side lengths to the nearest hundredth and the angle measures to the nearest degree.



Plot points A, B, and C, and draw $\triangle ABC$.

Find the side lengths: $AB = 4$, $BC = 7$

Use the distance formula to find the length of $\overline{AC}$.

$AC = \sqrt{\left(4 - (-3)\right)^2 + (-1 - 3)^2} = \sqrt{65} \approx 8.06$

Find the angle measures: $\overline{AB} \perp \overline{BC}$, so $m\angle B = 90°$.

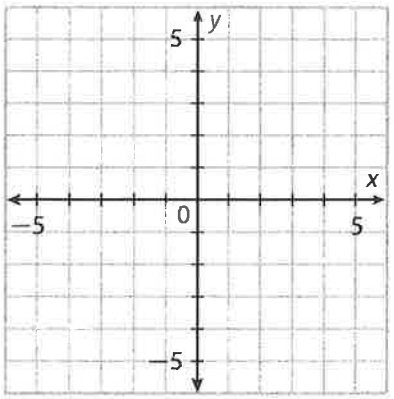
Use an inverse tangent ratio to find

$m\angle C = \tan^{-1}\left(\frac{AB}{BC}\right) = \tan^{-1}\left(\frac{4}{7}\right) \approx 30°$.

$\angle A$ and $\angle C$ are complementary, so $m\angle A \approx 90° - 30° = 60°$.

Ⓑ Triangle DEF has vertices $D(-4, 3)$, $E(3, 4)$, and $F(0, 0)$. Find the side lengths to the nearest hundredth and the angle measures to the nearest degree.

Plot points D, E, and F, and draw $\triangle DEF$.



$\angle F$ appears to be a right angle. To check, find the slope

of $\overline{DF}$: $\frac{-3}{0-} = \frac{}{} =$;

slope of $\overline{}$: $\frac{-}{-3} = \frac{}{} = \frac{}{}$;

so $m\angle F =$ °.

Find the side lengths using the distance formula:

$DE = \sqrt{(3- \quad)^2 + (\quad -3)^2} = \sqrt{} = \sqrt{} \approx$,

$DF = \sqrt{(\quad - \quad)^2 + (\quad -3)^2} = \sqrt{} =$,

$= \sqrt{(\quad - \quad)^2 + (\quad -4)^2} = \sqrt{} =$

Use an inverse sine ratio to find $m\angle D$.

$m\angle D = \sin^{-1}\left(\frac{EF}{}\right) = \sin^{-1}\left(\frac{}{}\right) =$ °

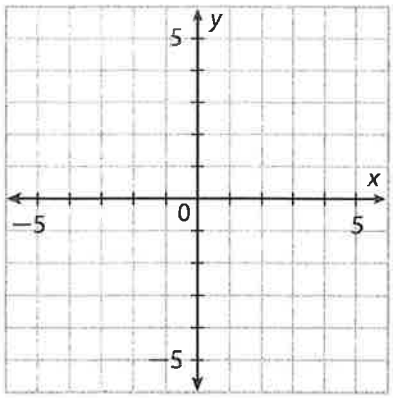
$\angle D$ and $\angle$ are complementary, so $m\angle$ $= 90° -$ ° = °.

Reflect

9. How does the given information determine which inverse trigonometric ratio you should use to determine an acute angle measure?

Your Turn

10. Triangle JKL has vertices $J(3, 5)$, $K(-3, 2)$, and $L(5, 1)$. Find the side lengths to the nearest hundredth and the angle measures to the nearest degree.



Elaborate

11. Would you use the area formula you determined in this lesson for a right triangle? Explain.

12. **Discussion** How does the process of solving a right triangle change when its vertices are located in the coordinate plane?

13. **Essential Question Check-In** How do you find the unknown angle measures in a right triangle?

Hamlet

Schools' synopsis by Rebecca Lenkiewicz

Marcellus:
'Something is rotten in the state of Denmark.'

On a dark, bitter, cold night Bernardo, a castle guard, keeps watch at Elsinore. His fellow sentry Marcellus joins him with Horatio who is visiting the fortress. For two nights running Marcellus and Bernardo have seen a Ghost, that of the King of Denmark, who died two months ago. Horatio is sceptical but the Ghost now appears to all three of them. Horatio asks it to speak. But it will not. And it disappears.

Claudius, the brother of the dead king, has succeeded him to the throne. He has also married Gertrude, his brother's widow. Laertes, the son of an old and senior counsellor Polonius, is part of Claudius' court. He asks Claudius' permission to return to Paris. The king grants him his request. Claudius turns next to Hamlet, whom he calls both cousin and son. Gertrude, Hamlet's mother, tries to persuade her son not to leave for Wittenburg where he has been a student. Claudius and Gertrude criticise the young Prince for being in mourning for so long. Hamlet agrees to stay in Elsinore and the royal party leave the chamber. Hamlet is left alone. He tells us of the anguish of his mother marrying his uncle within weeks of his father's death. His old friend Horatio enters and tells Hamlet about the Ghost of his dead father. They will watch together tonight.

The night is freezing and forbidding. The Ghost appears. Hamlet talks to it but it is silent. The Ghost indicates to Hamlet to go with him. The Prince's friends try to stop him. But Hamlet breaks from them and threatens to kill anyone who tries to hold him back. The Ghost tells Hamlet how he did not die from a snake bite but from his brother pouring poison into his ear. Hamlet must avenge his father's murder.

Hamlet feigns madness in order to accomplish his plan of killing Claudius. Ophelia is a young noblewoman. She lives at court and is Polonius' daughter. She has had romantic links with Hamlet in the past and Gertrude has always hoped that one day Ophelia and her son will marry. Ophelia tells Polonius how Hamlet has just come to her in a crazed state. Her father blames Hamlet's strangeness on his love for Ophelia. Polonius shares his theory with Gertrude and Claudius. Polonius and the king conceal themselves and watch Hamlet as he encounters and interrogates Ophelia. She knows they are being watched but he doesn't. He rejects her cruelly. Claudius and Gertrude recruit Hamlet's old friends Rosencrantz and Guildenstern to try and find out what is wrong with him.

A company of actors arrive. Hamlet is fond of them and asks them to enact a play *The Mouse-trap* which is all about the killing of a king. They do this in front of the court and Claudius becomes agitated and angry. He calls for light and leaves. Hamlet's trap has worked. Rosencrantz and Guildenstern tell Hamlet that his mother has summoned him to her room. On the way to Gertrude Hamlet sees Claudius praying. He could murder him now. But he decides against it, he wants to kill Claudius when he is doing an evil act not a holy one. Hamlet lashes out at Gertrude for marrying so quickly and to such an unworthy man. Hamlet realises that there is a third person hidden in the room. He stabs

behind a curtain with his sword. The blade goes through a body. Hamlet expects to find Claudius but instead it is Polonius, dead. Hamlet has unwittingly killed Ophelia's father. Claudius sends Hamlet to England and plots for him to be murdered. Laertes returns from Paris. He wants revenge for his father's murder. Laertes' sister Ophelia has lost her mind since their father's sudden death. She wanders around the court singing and giving out herbs for remedies. Ophelia falls into the river and drowns.

Hamlet escapes from Claudius' trap and returns. He and Horatio see an old man digging a grave. The gravedigger shows Hamlet a skull of the jester Yorrick who Hamlet knew. The funeral party arrive and Hamlet realises that Ophelia is dead. Laertes sees Hamlet and flies at him. Claudius arranges instead a friendly fight. He plots with Laertes that his sword will have a poisoned tip so that if Laertes even scratches Hamlet it will be fatal. Hamlet fights well and is winning but then Laertes lunges at him while Hamlet is unprepared. He draws blood. Hamlet is near to death but he does not know it. Hamlet picks up Laertes' sword and cuts him with it, still innocent of its being poisoned. Laertes realises that he too will soon die . Laertes confesses Claudius' plot to Hamlet. Gertrude drinks to her son but takes a cup that has been poisoned, intended for Hamlet. She dies. Hamlet realises he is dying too but he does manage to kill the king before losing all his strength. Horatio holds the dying Prince.

Hamlet:
'The rest is silence.'

Horatio:
'...Good night sweet Prince:
And flights of angels sing thee to thy rest.'

Young Fortinbras of Norway arrives and lays claim to the throne of Denmark.

Hamlet, Act III, Scene III

SCENE III. Another room in the Castle.
Enter King, attended.

KING.
I have sent to seek him and to find the body.
How dangerous is it that this man goes loose!
Yet must not we put the strong law on him:
He's lov'd of the distracted multitude,
Who like not in their judgment, but their eyes;
And where 'tis so, th'offender's scourge is weigh'd,
But never the offence. To bear all smooth and even,
This sudden sending him away must seem
Deliberate pause. Diseases desperate grown
By desperate appliance are reliev'd,
Or not at all.
Enter Rosencrantz.

How now? What hath befall'n?

ROSENCRANTZ.
Where the dead body is bestow'd, my lord,
We cannot get from him.
KING.
But where is he?
ROSENCRANTZ.
Without, my lord, guarded, to know your pleasure.
KING.
Bring him before us.
ROSENCRANTZ.
Ho, Guildenstern! Bring in my lord.
Enter Hamlet and Guildenstern.

KING.
Now, Hamlet, where's Polonius?
HAMLET.
At supper.
KING.
At supper? Where?
HAMLET.
Not where he eats, but where he is eaten. A certain convocation of politic worms are e'en at him. Your worm is your only emperor for diet. We fat all creatures else to fat us, and we fat ourselves for maggots. Your fat king and your lean beggar is but variable service,—two dishes, but to one table. That's the end.

KING.
Alas, alas!
HAMLET.
A man may fish with the worm that hath eat of a king, and eat of the fish that hath fed of that worm.

KING.
What dost thou mean by this?
HAMLET.
Nothing but to show you how a king may go a progress through the guts of a beggar.

KING.
Where is Polonius?
HAMLET.
In heaven. Send thither to see. If your messenger find him not there, seek him i' th'other place yourself. But indeed, if you find him not within this month, you shall nose him as you go up the stairs into the lobby.

KING.
[To some Attendants.] Go seek him there.
HAMLET.
He will stay till you come.
[Exeunt Attendants.]

KING.
Hamlet, this deed, for thine especial safety,—
Which we do tender, as we dearly grieve
For that which thou hast done,—must send thee hence
With fiery quickness. Therefore prepare thyself;
The bark is ready, and the wind at help,
Th'associates tend, and everything is bent
For England.
HAMLET.
For England?
KING.
Ay, Hamlet.
HAMLET.
Good.
KING.
So is it, if thou knew'st our purposes.
HAMLET.
I see a cherub that sees them. But, come; for England! Farewell, dear mother.

KING.
Thy loving father, Hamlet.
HAMLET.
My mother. Father and mother is man and wife; man and wife is one flesh; and so, my mother.
Come, for England.

[Exit.]

KING.
Follow him at foot. Tempt him with speed aboard;
Delay it not; I'll have him hence tonight.
Away, for everything is seal'd and done
That else leans on th'affair. Pray you make haste.
[Exeunt Rosencrantz and Guildenstern.]

And England, if my love thou hold'st at aught,—
As my great power thereof may give thee sense,
Since yet thy cicatrice looks raw and red
After the Danish sword, and thy free awe
Pays homage to us,—thou mayst not coldly set
Our sovereign process, which imports at full,
By letters conjuring to that effect,
The present death of Hamlet. Do it, England;
For like the hectic in my blood he rages,
And thou must cure me. Till I know 'tis done,
Howe'er my haps, my joys were ne'er begun.

12TH GRADE. WEEK 1. LESSON 2.

Hamlet by William Shakespeare

Shakespeare wrote Hamlet between 1599 and 1601. In this tragedy, a king is murdered by his brother, who marries his queen. In search of revenge, the ghost of the murdered king appears to his son, Hamlet, who vows revenge on his murderer.

1. The following quote from the Hamlet: "Now might I do it pat, now he is praying/ And now I'll do't. And so he goes to heaven;" provides evidence for which of the following theme?
    A. Theme of mortality
    B. Theme of madness
    C. Theme of revenge
2. What inference can be made from the following lines in the *Hamlet*: "A villain kills my father, and for thatI,/ his sole son, do this same villain send/ To heaven."?
    A. Hamlet is plotting the death of Claudius.
    B. Hamlet is dissatisfied with his mother.
    C. Hamlet is tired because he can't sleep
    D. Hamlet has decided to leave Denmark.
3. The following quote: "Offence's gilded hand may shove by justice," is an example of...
    A. Metaphor.
    B. Simile.
    C. Hyperbole.
    D. Personification.

4. In King Claudius' soliloquy, the following quote: "My crown, mine own ambition, and my queen.
May one be pardon'd and retain th'offence?" is evidence that…
    A. Claudius is plagued by his conscience
    B. Claudius is guilty of murder
    C. Claudius is hiding something from others
    D. All of the above

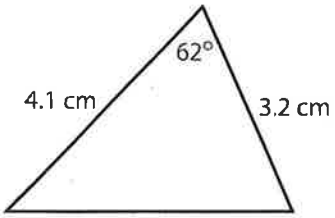
5. According to textual evidence in Act III, Scene III, how does Hamlet feel about Claudius?
    A. He feels guilty
    B. He despises him
    C. He is tired of dealing with his imagination
    D. He loves Claudius.

Evaluate: Homework and Practice

- Online Homework
- Hints and Help
- Extra Practice

Find the area of each triangle to the nearest tenth.

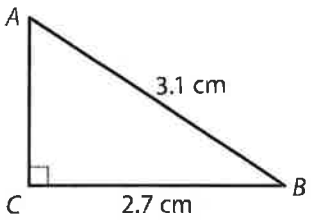
1.



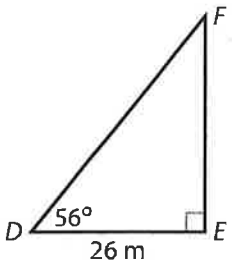
2. In $\triangle PQR$, $PR = 23$ mm, $QR = 39$ mm, and $m\angle R = 163°$.

Solve each right triangle. Round lengths to the nearest tenth and angles to the nearest degree.

3.



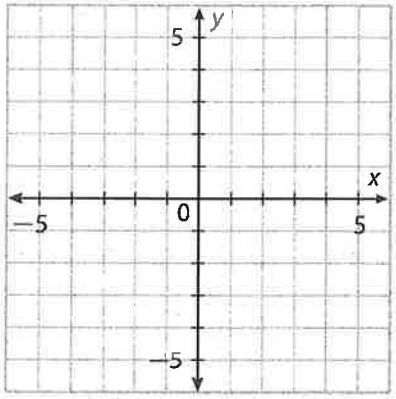
4.



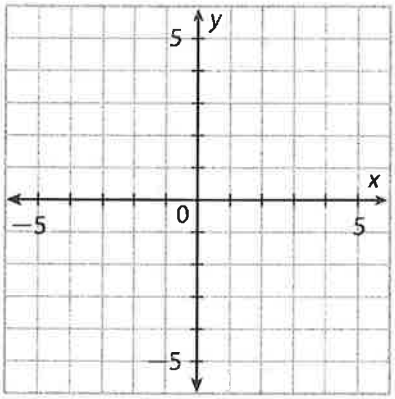
5. Right $\triangle PQR$ with $\overline{PQ} \perp \overline{PR}$, $QR = 47$ mm, and $m\angle Q = 52°$

Solve each triangle. Find the side lengths to the nearest hundredth and the angle measures to the nearest degree.

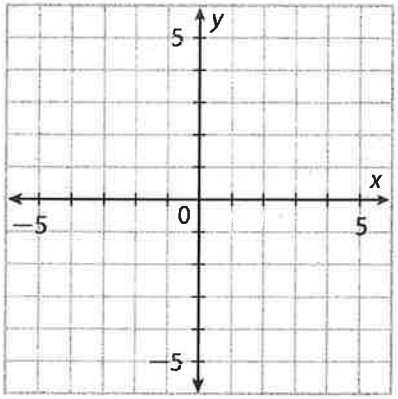
6. Triangle ABC with vertices $A(-4, 4)$, $B(3, 4)$, and $C(3, -2)$



7. Triangle JKL with vertices $J(-3, 1)$, $K(-1, 4)$, and $L(6, -5)$



8. Triangle PQR with vertices $P(5, 5)$, $Q(-5, 3)$, and $R(-4, -2)$



POETRY FOUNDATION

A Valediction: Forbidding Mourning

BY JOHN DONNE

As virtuous men pass mildly away,
  And whisper to their souls to go,
Whilst some of their sad friends do say
  The breath goes now, and some say, No:

So let us melt, and make no noise,
  No tear-floods, nor sigh-tempests move;
'Twere profanation of our joys
  To tell the laity our love.

Moving of th' earth brings harms and fears,
  Men reckon what it did, and meant;
But trepidation of the spheres,
  Though greater far, is innocent.

Dull sublunary lovers' love
  (Whose soul is sense) cannot admit
Absence, because it doth remove
  Those things which elemented it.

But we by a love so much refined,
  That our selves know not what it is,
Inter-assured of the mind,
  Care less, eyes, lips, and hands to miss.

Our two souls therefore, which are one,
  Though I must go, endure not yet
A breach, but an expansion,
  Like gold to airy thinness beat.

If they be two, they are two so
  As stiff twin compasses are two;
Thy soul, the fixed foot, makes no show

To move, but doth, if the other do.

And though it in the center sit,
Yet when the other far doth roam,
It leans and hearkens after it,
And grows erect, as that comes home.

Such wilt thou be to me, who must,
Like th' other foot, obliquely run;
Thy firmness makes my circle just,
And makes me end where I begun.

Ideas for modern living: Carpe diem

What it means to seize today, yesterday and tomorrow

Mark Vernon

Sat 24 Apr 2010 19.07 EDT

"Carpe diem" means "Seize the day" and comes from an ode by Horace. However, a friend of mine, who happens to be a former secretary of The Horatian Society, and speaks Latin as you and I do English, tells me that it can be translated in a more interesting way. It could equally well be phrased: "Harvest the day."

I like that. It's less aggressive and opportunistic. After all, it is often said that you reap what you sow, and so harvesting the day suggests that you have a lot of responsibility for what the day offers you. In his own translation, my friend goes a step further and writes, "Gather in today," which picks up the other sentiment from the ode – that we might live this day as if it were our last. Today is the day when we can enjoy life, for yesterday is gone, and tomorrow never comes.

That said, it's remarkably hard to do. So much in our lives would have us recall what has happened, or hope for what might happen. There's the nostalgia tendency, the pressure to reflect on school days, or when the kids were young. "The best days of our lives" are said to be behind us.

And then there's the pressure to look after tomorrow. We take out mortgages and devote our lives to paying off the debt, hoping that the house will be ours. Or we pay into pension plans and life insurance. It's all good. But put together, nostalgia and concern for the future do have the effect of distancing us from today.

In his famous poem, *Days*, Philip Larkin asked what days might be for. He replied that days are where we live, for "Where can we live but days?" Seize, harvest and gather in today.

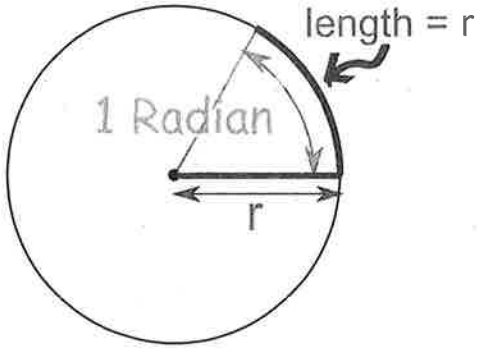
12TH GRADE. WEEK 1. LESSON 3.

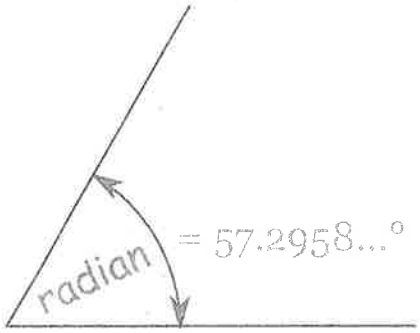
"A Valediction Forbidding Mourning" by John Donne.

1. In Donne's time, the earth was being mapped, and explorers were accessing and conquering unknown areas of the world. Which of the following quotes references the idea of love as a voyage of discovery?
    A. "And makes me end where I begun."
    B. "Thy soul, the fixed foot, makes no show"
    C. "Yet when the other far doth roam,"
    D. "Like gold to airy thinness beat."
2. Donne lived in a historical time when different religious denominations were breaking from the Roman Catholic Church. Which imagery in the poem constitutes a religious allusion?
    A. "So let us melt, and make no noise,"
    B. "Dull sublunary lovers' love"
    C. "But we by a love so much refined,"
    D. "'Twere profanation of our joys"
3. The following quote: "But trepidation of the spheres,/Though greater far, is innocent" is an example of…
    A. Metaphor
    B. Simile
    C. Enjambment
    D. Symbol
4. Which are the major themes in the poem?
    A. Spiritual love versus physical love
    B. Love, separation and death
    C. Love, death and voyage
    D. Love and transcendence
5. Which of the following quotes provides an example of paradox?
    A. "Our two souls therefore, which are one"
    B. "Like gold to airy thinness beat"
    C. "Absence, because it doth remove"
    D. "Care less, eyes, lips, and hands to miss"

Radians

The angle made when the radius is wrapped round the circle:

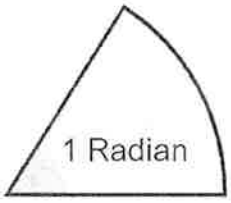




1 Radian is *about* 57.2958 degrees.

Why "57.2958..." degrees? We will see in a moment.

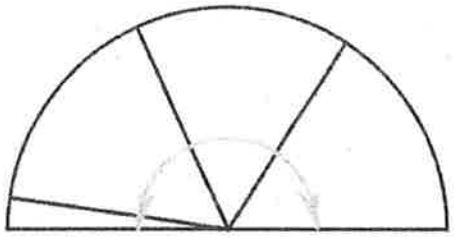
The **Radian** is a pure measure based on the **Radius** of the circle:



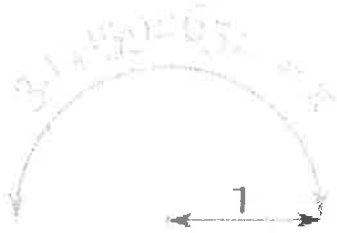
Radian: the angle made when we take the **radius** and wrap it round the circle.

Radians and Degrees

Let us see why 1 Radian is equal to 57.2958... degrees:



3.1416... Radians
= π Radians
= 180°



In a half circle there are **π** radians, which is also 180°

π radians = 180°

So **1 radian** = 180°/π

= 57.2958...°

(approximately)

To go from **radians to degrees**: multiply by 180, divide by **π**

To go from **degrees to radians**: multiply by **π**, divide by 180

Here is a table of equivalent values:

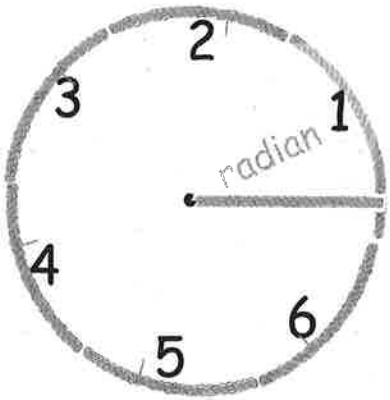
Degrees	Radians (exact)	Radians (approx)
30°	π/6	0.524
45°	π/4	0.785
60°	π/3	1.047

90°	$\pi/2$	1.571
180°	π	3.142
270°	$3\pi/2$	4.712
360°	2π	6.283

Example: How Many Radians in a Full Circle?

Imagine you cut pieces of string exactly the length from the **center to the circumference of a circle** ...

... how many pieces do you need to go **once around** the circle?



Answer: 2π (or about **6.283** pieces of string).

Radians Preferred by Mathematicians

Because the radian is based on the pure idea of *"the radius being laid along the circumference"*, it often gives simple and natural results when used in mathematics.

For example, look at the sine function for very small values:

x (radians)	1	0.1	0.01	0.001
sin(x)	0.8414710	0.0998334	0.0099998	0.0009999998

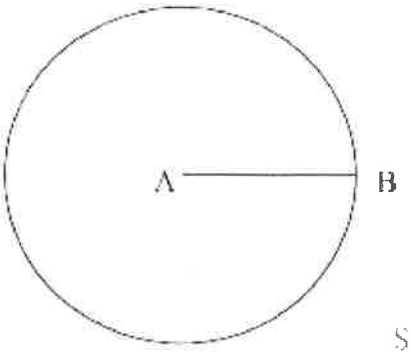
For very small values. "x" and "sin(x)" are almost the same
(as long as "x" is in Radians!)

There will be other examples like that as you learn more about mathematics.

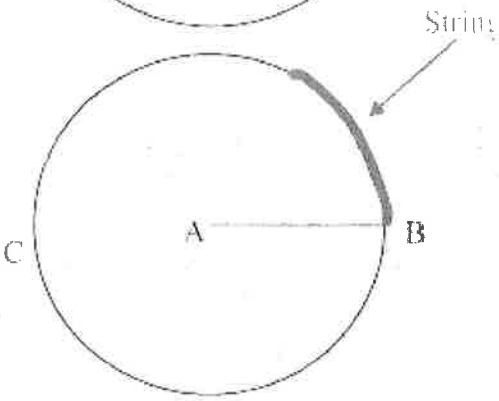
Conclusion

So, degrees are easier to use in everyday work, but radians are much better for mathematics.

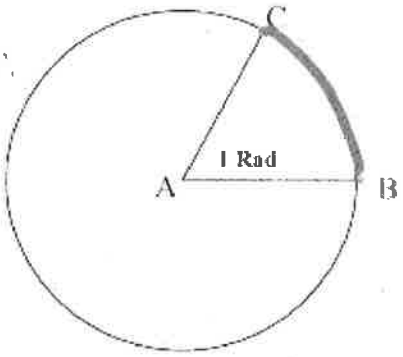
1) Construct a circle whose radius is equal to the length of the piece of string given.
2) Draw in the radius and label it AB as shown.



3) Using the string, place one end of it at B and lay it out on the circumference. Mark C at the end of the string.



4) Join point A to point C.
The angle created in the centre of the circle is called "**1 Radian**".

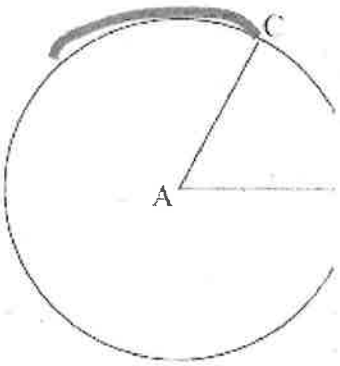


NOTE: Activities 1 to 4 show how **to construct** an angle of size 1 radian

5) Using a protractor measure (and write down) the approximate size of this radian in degrees.

Approximate size of 1 radian in degrees = _____

6) Using the string **on the circumference** repeat step 4 above until the entire circumference has been covered.



7) From the work you have done on this circle answer the following :

a) Estimate how many radians are in a full circle _____

b) Estimate how many radians are in a semi-circle _____

8) Write down, in your own words, what you understand by the phrase "*An angle of size one radian.*"

_____

_____

_____

9) Complete the following table, using circles drawn by the class.

Circle	Radius	Estimation of 1 radian
Circle 1 *		
Circle 2		
Circle 3		
Circle 4		

* the circle you constructed at question 1 above

Based on the table above, what affect does the size of the radius of a circle have on the size of 1 radian ?

_____

_____

_____

POETRY FOUNDATION

The Love Song of J. Alfred Prufrock

BY T. S. ELIOT

S'io credesse che mia risposta fosse
A persona che mai tornasse al mondo,
Questa fiamma staria senza piu scosse.
Ma percioche giammai di questo fondo
Non torno vivo alcun, s'i'odo il vero,
Senza tema d'infamia ti rispondo.

Let us go then, you and I,
When the evening is spread out against the sky
Like a patient etherized upon a table;
Let us go, through certain half-deserted streets,
The muttering retreats
Of restless nights in one-night cheap hotels
And sawdust restaurants with oyster-shells:
Streets that follow like a tedious argument
Of insidious intent
To lead you to an overwhelming question ...
Oh, do not ask, "What is it?"
Let us go and make our visit.

In the room the women come and go
Talking of Michelangelo.

The yellow fog that rubs its back upon the window-panes,
The yellow smoke that rubs its muzzle on the window-panes,
Licked its tongue into the corners of the evening,
Lingered upon the pools that stand in drains,
Let fall upon its back the soot that falls from chimneys,
Slipped by the terrace, made a sudden leap,
And seeing that it was a soft October night,
Curled once about the house, and fell asleep.

And indeed there will be time
For the yellow smoke that slides along the street,
Rubbing its back upon the window-panes;
There will be time, there will be time
To prepare a face to meet the faces that you meet;
There will be time to murder and create,
And time for all the works and days of hands
That lift and drop a question on your plate;
Time for you and time for me,
And time yet for a hundred indecisions,
And for a hundred visions and revisions,
Before the taking of a toast and tea.

In the room the women come and go
Talking of Michelangelo.

And indeed there will be time
To wonder, "Do I dare?" and, "Do I dare?"
Time to turn back and descend the stair,
With a bald spot in the middle of my hair —
(They will say: "How his hair is growing thin!")
My morning coat, my collar mounting firmly to the chin,
My necktie rich and modest, but asserted by a simple pin —
(They will say: "But how his arms and legs are thin!")
Do I dare
Disturb the universe?
In a minute there is time
For decisions and revisions which a minute will reverse.

For I have known them all already, known them all:
Have known the evenings, mornings, afternoons,
I have measured out my life with coffee spoons;
I know the voices dying with a dying fall
Beneath the music from a farther room.
So how should I presume?

And I have known the eyes already, known them all—
The eyes that fix you in a formulated phrase,
And when I am formulated, sprawling on a pin,
When I am pinned and wriggling on the wall,
Then how should I begin
To spit out all the butt-ends of my days and ways?

And how should I presume?

And I have known the arms already, known them all—
Arms that are braceleted and white and bare
(But in the lamplight, downed with light brown hair!)
Is it perfume from a dress
That makes me so digress?
Arms that lie along a table, or wrap about a shawl.
And should I then presume?
And how should I begin?

Shall I say, I have gone at dusk through narrow streets
And watched the smoke that rises from the pipes
Of lonely men in shirt-sleeves, leaning out of windows? ...

I should have been a pair of ragged claws
Scuttling across the floors of silent seas.

And the afternoon, the evening, sleeps so peacefully!
Smoothed by long fingers,
Asleep ... tired ... or it malingers,
Stretched on the floor, here beside you and me.
Should I, after tea and cakes and ices,
Have the strength to force the moment to its crisis?
But though I have wept and fasted, wept and prayed,
Though I have seen my head (grown slightly bald) brought in upon a platter,
I am no prophet — and here's no great matter;
I have seen the moment of my greatness flicker,
And I have seen the eternal Footman hold my coat, and snicker,
And in short, I was afraid.

And would it have been worth it, after all,
After the cups, the marmalade, the tea,
Among the porcelain, among some talk of you and me,
Would it have been worth while,
To have bitten off the matter with a smile,
To have squeezed the universe into a ball
To roll it towards some overwhelming question,
To say: "I am Lazarus, come from the dead,
Come back to tell you all, I shall tell you all"—
If one, settling a pillow by her head
Should say: "That is not what I meant at all;

That is not it, at all."

And would it have been worth it, after all,
Would it have been worth while,
After the sunsets and the dooryards and the sprinkled streets,
After the novels, after the teacups, after the skirts that trail along the floor—
And this, and so much more?—
It is impossible to say just what I mean!
But as if a magic lantern threw the nerves in patterns on a screen:
Would it have been worth while
If one, settling a pillow or throwing off a shawl,
And turning toward the window, should say:
"That is not it at all,
That is not what I meant, at all."

No! I am not Prince Hamlet, nor was meant to be;
Am an attendant lord, one that will do
To swell a progress, start a scene or two,
Advise the prince; no doubt, an easy tool,
Deferential, glad to be of use,
Politic, cautious, and meticulous;
Full of high sentence, but a bit obtuse;
At times, indeed, almost ridiculous—
Almost, at times, the Fool.

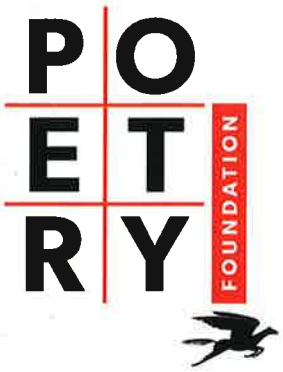
I grow old ... I grow old ...
I shall wear the bottoms of my trousers rolled.

Shall I part my hair behind? Do I dare to eat a peach?
I shall wear white flannel trousers, and walk upon the beach.
I have heard the mermaids singing, each to each.

I do not think that they will sing to me.

I have seen them riding seaward on the waves
Combing the white hair of the waves blown back
When the wind blows the water white and black.
We have lingered in the chambers of the sea
By sea-girls wreathed with seaweed red and brown
Till human voices wake us, and we drown.

Source: *Collected Poems 1909-1962* (1963)



POETRY FOUNDATION

The River-Merchant's Wife: A Letter

BY EZRA POUND

After Li Po

While my hair was still cut straight across my forehead
I played about the front gate, pulling flowers.
You came by on bamboo stilts, playing horse,
You walked about my seat, playing with blue plums.
And we went on living in the village of Chōkan:
Two small people, without dislike or suspicion.
At fourteen I married My Lord you.
I never laughed, being bashful.
Lowering my head, I looked at the wall.
Called to, a thousand times, I never looked back.

At fifteen I stopped scowling,
I desired my dust to be mingled with yours
Forever and forever, and forever.
Why should I climb the look out?

At sixteen you departed
You went into far Ku-tō-en, by the river of swirling eddies,
And you have been gone five months.
The monkeys make sorrowful noise overhead.

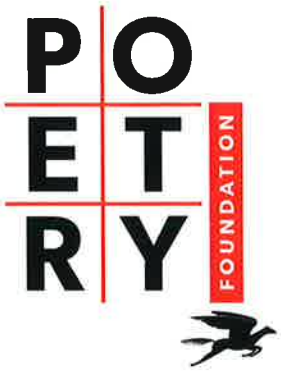
You dragged your feet when you went out.
By the gate now, the moss is grown, the different mosses,
Too deep to clear them away!
The leaves fall early this autumn, in wind.
The paired butterflies are already yellow with August
Over the grass in the West garden;
They hurt me.
I grow older.
If you are coming down through the narrows of the river Kiang,

Please let me know beforehand,
And I will come out to meet you
As far as Chō-fū-Sa.

Notes:
The epigraph of this poem was originally omitted in the changeover to the new website. Because of this, reciting the epigraph is optional for the 2019-2020 Poetry Out Loud season.

n/a

Source: *Selected Poems* (1957)



12TH GRADE. WEEK 1. LESSON 4.

Read "The Love Song of Alfred J. Prufrock" and "The River Merchant's Wife: A Letter."

1. Which of the two poems BEST represents the theme of pilgrimage, and why?

2. Briefly compare and contrast the main themes in both poems in the space below:

3. Use the graphic organizer below to provide examples of figures of speech:

	"The Love Song of J. Alfred Prufrock"	"The River Merchant's Wife: A Letter."
Metaphor		
Simile		
Personification		
Paradox		
Hyperbole		

Name _____ Class _____ Date _____

18.1 Angles of Rotation and Radian Measure

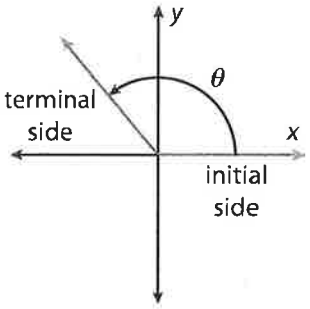
Essential Question: What is the relationship between the unit circle and radian measure?

Resource Locker

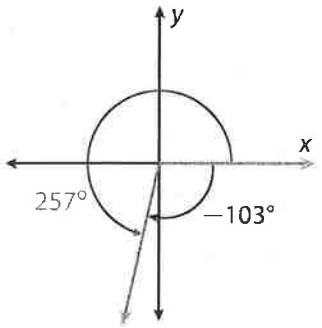
Explore 1 Drawing Angles of Rotation and Finding Coterminal Angles

In trigonometry, an **angle of rotation** is an angle formed by the starting and ending positions of a ray that rotates about its endpoint. The angle is in *standard position* in a coordinate plane when the starting position of the ray, or *initial side* of the angle, is on the positive x-axis and has its endpoint at the origin. To show the amount and direction of rotation, a curved arrow is drawn to the ending position of the ray, or *terminal side* of the angle.

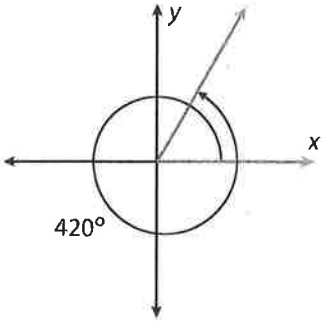
In geometry, you were accustomed to working with angles having measures between 0° and 180°. In trigonometry, angles can have measures greater than 180° and even less than 0°. To see why, think in terms of revolutions, or complete circular motions. Let θ be an angle of rotation in standard position.



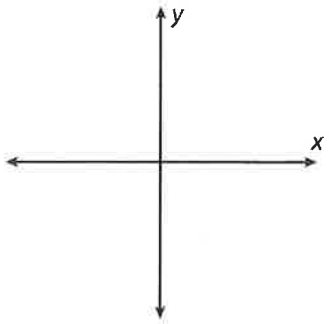
- If the rotation for an angle θ is less than 1 revolution in a counterclockwise direction, then the measure of θ is between 0° and 360°. An angle of rotation measured *clockwise* from standard position has a *negative* angle measure. **Coterminal angles** are angles that share the same terminal side. For example, the angles with measures of 257° and −103° are coterminal, as shown.



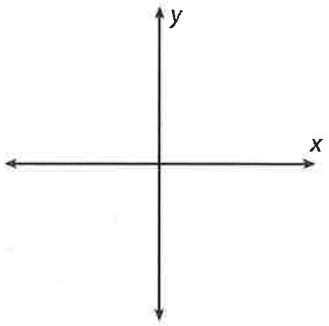
- If the rotation for θ is more than 1 revolution but less than 2 revolutions in a counterclockwise direction, then the measure of θ is between 360° and 720°, as shown. Because you can have any number of revolutions with an angle of rotation, there is a counterclockwise angle of rotation corresponding to any positive real number and a clockwise angle of rotation corresponding to any negative real number.



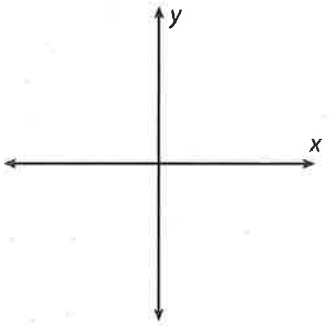
Ⓐ Draw an angle of rotation of 310°. In what quadrant is the terminal side of the angle?



Ⓑ On the same graph from the previous step, draw a positive coterminal angle. What is the angle measure of your angle?



Ⓒ On the same graph from the previous two steps, draw a negative coterminal angle. What is the angle measure of your angle?



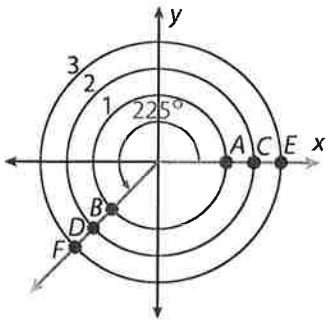
Reflect

1. Is the measure of an angle of rotation in standard position completely determined by the position of its terminal side? Explain.

2. Find the measure between 720° and 1080° of an angle that is coterminal with an angle that has a measure of −30°. In addition, describe a general method for finding the measure of any angle that is coterminal with a given angle.

Explore 2 Understanding Radian Measure

The diagram shows three circles centered at the origin. The arcs that are on the circle between the initial and terminal sides of the 225° central angle are called *intercepted arcs*.



$\overset{\frown}{AB}$ is on a circle with radius 1 unit.

$\overset{\frown}{CD}$ is on a circle with radius 2 units.

$\overset{\frown}{EF}$ is on a circle with radius 3 units.

Notice that the intercepted arcs have different lengths, although they are intercepted by the same central angle of 225°. You will now explore how these arc lengths are related to the angle.

Ⓐ The angle of rotation is _____ degrees counterclockwise.

There are _____ degrees in a circle.

225° represents _____ of the total number of degrees in a circle.

So, the length of each intercepted arc is _____ of the total circumference of the circle that it lies on.

Ⓑ Complete the table. To find the length of the intercepted arc, use the fraction you found in the previous step. Give all answers in terms of π.

Radius, r	Circumference, C $(C = 2\pi r)$	Length of Intercepted Arc, s	Ratio of Arc Length to Radius, $\frac{s}{r}$
1			
2			
3			

Reflect

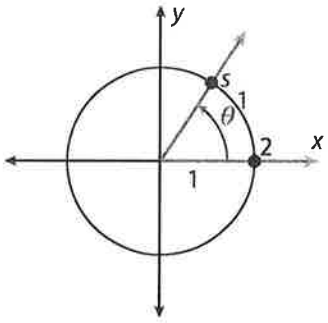
3. What do you notice about the ratios $\frac{s}{r}$ in the fourth column of the table?

4. When the ratios of the values of a variable y to the corresponding values of another variable x all equal a constant k, y is said to be *proportional* to x, and the constant k is called the *constant of proportionality*. Because $\frac{y}{x} = k$, you can solve for y to get $y = kx$. In the case of the arcs that are intercepted by a 225° angle, is the arc length s proportional to the radius r? If so, what is the constant of proportionality, and what equation gives s in terms of r?

5. Suppose that the central angle is 270° instead of 225°. Would the arc length s still be proportional to the radius r? If so, would the constant of proportionality still be the same? Explain.

Explain 1 Converting Between Degree Measure and Radian Measure

For a central angle θ that intercepts an arc of length s on a circle with radius r, the **radian measure** of the angle is the ratio $\theta = \frac{s}{r}$. In particular, on a *unit circle*, a circle centered at the origin with a radius of 1 unit, $\theta = s$. So, 1 *radian* is the angle that intercepts an arc of length 1 on a unit circle, as shown.



θ = 1 radian

Recall that there are 360° in a full circle. Since the circumference of a circle of radius r is $s = 2\pi r$, the number of radians in a full circle is $\frac{2\pi r}{r} = 2\pi$. Therefore, $360° = 2\pi$ radians. So, $1° = \frac{2\pi}{360} = \frac{\pi}{180}$ radians and 1 radian $= \frac{360}{2\pi} = \frac{180}{\pi}$ degrees. This result is summed up in the following table.

CONVERTING DEGREES TO RADIANS	CONVERTING RADIANS TO DEGREES
Multiply the number of degrees by $\left(\frac{\pi \text{ radians}}{180°}\right)$.	Multiply the number of radians by $\left(\frac{180°}{\pi \text{ radians}}\right)$.

Example 1 **Convert each measure from degrees to radians or from radians to degrees.**

Ⓐ

Degree measure	Radian measure
20°	$\frac{\pi}{180°} \cdot 20° = \frac{\pi}{9}$
315°	$\frac{\pi}{180°} \cdot 315° = \frac{7\pi}{4}$
600°	$\frac{\pi}{180°} \cdot 600° = \frac{10\pi}{3}$
−60°	$\frac{\pi}{180°} \cdot (-60°) = -\frac{\pi}{3}$
−540°	$\frac{\pi}{180°} \cdot (-540°) = -3\pi$

Ⓑ

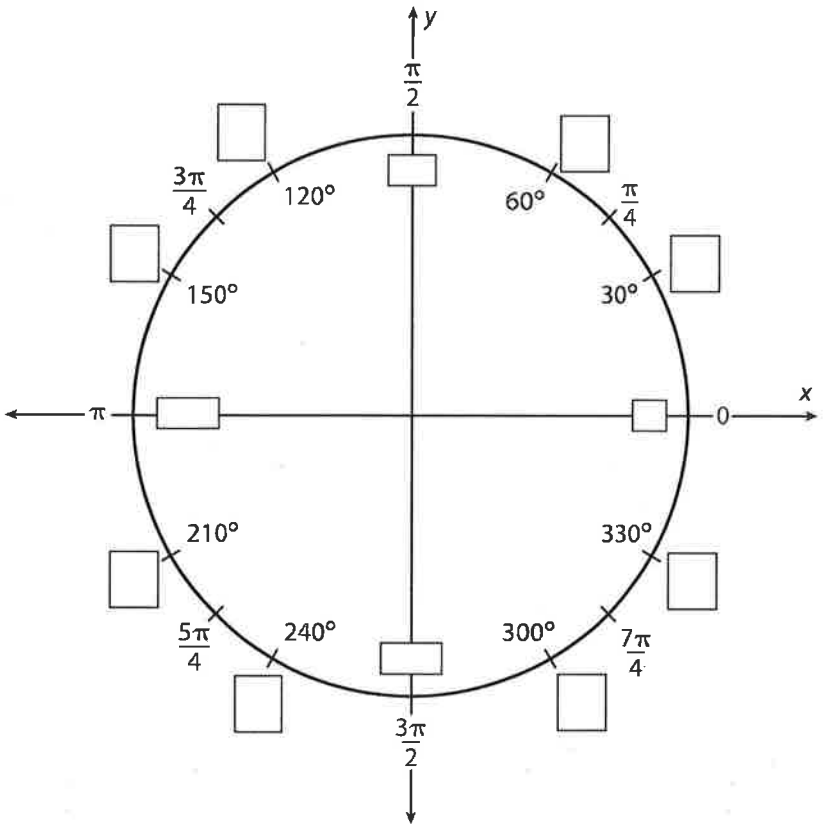
Radian measure	Degree measure
$\frac{\pi}{8}$	$\frac{180°}{\pi} \cdot \frac{\pi}{8} =$
$\frac{4\pi}{3}$	$\cdot \frac{4\pi}{3} =$
$\frac{9\pi}{2}$	
$-\frac{7\pi}{12}$	
$-\frac{13\pi}{6}$	

Reflect

6. Which is larger, a degree or a radian? Explain.

_____

7. The unit circle below shows the measures of angles of rotation that are commonly used in trigonometry, with radian measures outside the circle and degree measures inside the circle. Provide the missing measures.



Your Turn

Convert each measure from degrees to radians or from radians to degrees.

8. −495°

9. $\frac{13\pi}{12}$

Explain 2 Solving a Real-World Problem Involving Arc Length

As you saw in the first Explain, for a central angle θ in radian measure, $\theta = \frac{s}{r}$ where s is the intercepted arc length. Multiplying both sides of the equation by r gives the arc length formula for a circle:

Arc Length Formula

For a circle of radius r, the arc length s intercepted by a central angle θ (measured in radians) is given by the following formula.

$$s = r\theta$$

Many problems involving arc length also involve *angular velocity*, which is the angle measure through which an object turns in a given time interval. For example, the second hand of a clock has an angular velocity of 360° per minute, or 6° per second. Angular velocity may also be expressed in radians per unit of time. This makes finding the arc length traversed in an amount of time especially easy by using the arc length formula.

Ⓐ **The Sun** A point on the Sun's equator makes a full revolution once every 25.38 days. The Sun has a radius of about 432,200 miles at its equator. What is the angular velocity in radians per hour of a point on the Sun's equator? What distance around the Sun's axis does the point travel in one hour? How does this compare with the distance of about 1038 miles traveled by a point on Earth's equator in an hour?

One revolution is 2π radians. The angular velocity in radians per day is $\frac{2\pi}{25.38}$. Convert this to radians per hour.

$$\frac{2\pi \text{ radians}}{25.38 \text{ days}} \cdot \frac{1 \text{ day}}{24 \text{ hours}} = \frac{2\pi \text{ radians}}{25.38(24) \text{ hours}}$$

$$\approx 0.01032 \text{ radians/h}$$

The distance the point travels in an hour is the arc length it traverses in an hour.

$s = r\theta$

$= 432{,}200(0.01032)$

≈ 4460

The point travels about 4460 miles around the Sun's axis in an hour. This is more than 4 times farther than a point on Earth's equator travels in the same time.

Ⓑ **The Earth** Earth's equator is at a latitude of 0°. The Arctic circle is at a latitude of 66.52°N. The diameter of the equator is 7926 miles. The diameter of the Arctic circle is 3150 miles.

a. Find the angular velocity in degrees per minute of a point on the equator and of a point on the Arctic circle.

b. How far does a point on the Equator travel in 15 minutes?

c. How long will it take a point on the Arctic circle to travel this distance?

a. Every point on Earth completes 1 revolution of _____ degrees each 24 hours, so the angular velocities of the points will be the same. Convert the angular velocity to degrees per minute.

$$\frac{\quad^\circ}{\text{h}} \cdot \frac{1\text{ h}}{60\text{ min}} = \frac{\quad^\circ}{24(60)\text{ min}} = \quad ^\circ/\text{min}$$

The angular velocity is $\quad^\circ$/min.

b. Multiply the time by the angular velocity to find the angle through which a point rotates in 15 minutes.

$$\text{min} \cdot 0.25^\circ/\text{min} = \quad ^\circ$$

Write a proportion to find the distance to the nearest tenth that this represents at the equator, where Earth's circumference is $\quad^\circ$ · 7926 miles.

$$\frac{3.75^\circ}{\quad^\circ} = \frac{x\text{ mi}}{\quad\cdot 7926\text{ mi}}$$

$$x = \frac{3.75\pi(7926)}{360}$$

$$x \approx$$

A point at the equator travels about _____ miles in 15 minutes.

c. Write a proportion to find the angle of rotation to the nearest thousandth required to move a point 259.4 miles on the Arctic circle, where the circumference is $\quad^\circ$ · 3150 miles.

$$\frac{259.4\text{ mi}}{\quad\cdot 3150\text{ mi}} = \frac{x^\circ}{\quad^\circ}$$

$$x = \frac{259.4(360)}{3150\pi}$$

$$x \approx$$

Use the angular velocity to find the time t to the nearest hundredth required for a point on the Arctic circle to move through an angle of rotation of 9.437°.

$$\left(\quad^\circ/\text{min}\right)(t\text{ min}) = 9.437^\circ$$

$$t \approx$$

It takes about _____ minutes for a point on the Arctic circle to travel the same distance that a point on the equator travels in 15 minutes.

Reflect

10. How does using an angle of rotation to find the length of the arc on a circle intercepted by the angle differ when degrees are used from when radians are used?

_____

_____

_____

_____

Your Turn

11. **Astronomy** A neutron star (an incredibly dense collapsed star) in the Sagittarius Galaxy has a radius of 10 miles and completes a full revolution every 0.0014 seconds. Find the angular velocity of the star in radians per second, then use this velocity to determine how far a point on the equator of the star travels each second. How does this compare to the speed of light (about 186,000 mi/sec)?

12. **Geography** The northeastern corner of Maine is due north of the southern tip of South America in Chile. The difference in latitude between the locations is 103°. Using both degree measure and radian measure, and a north-south circumference of Earth of 24,860 miles, find the distance between the two locations.

Elaborate

13. Given the measure of two angles of rotation, how can you determine whether they are coterminal without actually drawing the angles?

14. What is the conversion factor to go from degrees to radians? What is the conversion factor to go from radians to degrees? How are the conversion factors related?

15. Essential Question Check-In An angle of rotation in standard position intercepts an arc of length 1 on the unit circle. What is the radian measure of the angle of rotation?

Garcia, Cristina. *Dreaming in Cuban*. New York: Random House, 1993. (1992)
From "The Languages Lost: Six Days in April"

Abuela gives me a box of letters she wrote to her onetime lover in Spain, but never sent. She shows me his photograph, too. It's very well preserved. He'd be good-looking by today's standards, well built with a full beard and kind eyes, almost professorial. He wore a crisp linen suit and a boater tilted slightly to the left. Abuela tells me she took the picture herself one Sunday on the Malecón,

She also gives me a book of poems she's had since 1930, when she heard García Lorca read at the Principal de la Comedia Theater. Abuela knows each poem by heart, and recites them quite dramatically.

I've started dreaming in Spanish, which has never happened before. I wake up feeling different, like something inside me is changing, something chemical and irreversible. There's a magic here working its way through my veins. There's something about the vegetation, too, that I respond to instinctively—the stunning bougainvillea, the flamboyants and jacarandas, the orchids growing from the trunks of the mysterious ceiba trees. And I love Havana, its noise and decay and painted ladyness. I could happily sit on one of those wrought-iron balconies for days, or keep my grandmother company on her porch, with its ringside view of the sea. I'm afraid to lose all this. To lose Abuela Celia again. But I know that sooner or later I'd have to return to New York. I know now it's where I belong—not instead of here, but more than here. How can I tell my grandmother this?

Media Text
Portal to selected interviews with author Cristina García:
http://www.cristinagarcianovelist.com/index.php?page=selectedinterviews

12TH GRADE. WEEK 1. LESSON 5.

"Dreaming in Cuban" by Cristina Garcia.

1. According to the excerpt you read, what does the title allude to?
    A. A metaphor
    B. A dream the narrator had
    C. The turning point in the story
    D. Her longing for grandma Celia
2. What is the central idea in the story you read?
    A. The need to belong
    B. The immigrant experience
    C. Love and loss
    D. Oneness
3. Which of the following ideas is entailed in the meaning of the following quote: "I wake up feeling different, like something inside me is changing, something chemical and irreversible"
    A. The narrator is having a hard time finding herself
    B. The narrator traveled to Cuba to know her family
    C. The narrator is slowly discovering her identity
    D. The narrator misses life in the United States
4. What does the narrator mean when she says that "I'm afraid to lose all this. To lose Abuela Celia again."?
    A. She won't be able to keep in contact with her family so easily once in New York
    B. She is afraid to get lost in the crown once in New York
    C. She is starting to feel nostalgia for the newly-found bond with her family
    D. She is scared to lose her identity.
5. Which of the following quotes provides evidence for the central idea?
    A. "Abuela gives me a box of letters she wrote to her onetime lover in Spain,"
    B. "Abuela knows each poem by heart, and recites them quite dramatically"
    C. "And I love Havana, its noise and decay and painted ladyness"
    D. "There's a magic here working its way through my veins."

Evaluate: Homework and Practice

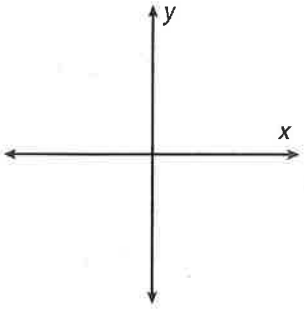
Personal Math Trainer

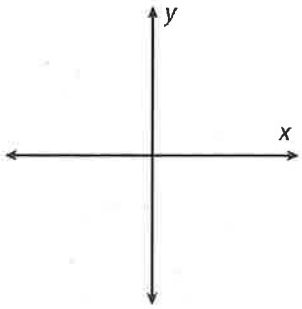
- Online Homework
- Hints and Help
- Extra Practice

Draw the indicated angle of rotation in standard position.

1. A positive angle coterminal to 130°

2. A negative angle coterminal to 130°





For each angle, find the nearest two positive coterminal angles and the nearest two negative coterminal angles.

3. 84°

4. 420°

5. $-\frac{\pi}{3}$

6. $\frac{5\pi}{2}$

Convert each measure from degrees to radians or from radians to degrees.

7. 70°

8. −270°

9. −945°

10. 2160°

11. $\frac{33\pi}{18}$

12. $\frac{11\pi}{4}$

13. $-\frac{5\pi}{3}$

14. $-\frac{7\pi}{2}$