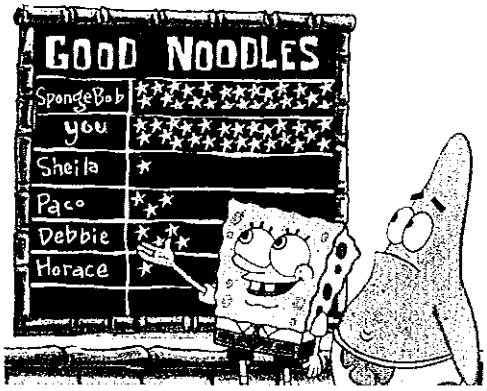


ONLINE

I hope you are staying safe and enjoying your family time together.

First of all....remember that on the **Thursday and Friday before we left , I gave you AMI days 6-15**. You should already have your purple worksheets, graph paper, and formula sheets for those. For all of this work you ONLY need a simple calculator. **No graphing calculator is needed**. I have attached AMI days 16-25 to this letter. Hopefully I have counted the days/calendar correctly. I think AMI day 10 begins on Monday, March 30. This packet, along with the one I gave you before we left, should get you through April 20. Governor Hutchison, as of right now, says schools will be re-opening then.

If you have any questions, please contact me. My email address is...
Mandy.Brown@norfork.k12.ar.us

Send a text to

81010

Text this message

@k43kg3

I have also started a remind text group. Do the following steps to be added to the **Trigonometry** group. Give these instructions to your parents also. They can also be a part of our group!!! (It's going to be sooooo much fun!!) Once you are a part of our group, I will respond and ask you your name, so I will know who you are.

IF YOU WANT TO KNOW YOUR CURRENT GRADE AND CANNOT OPEN YOUR ESCHOOL, LET ME KNOW, AND I WILL TELL YOU WHAT IT IS. Some of you have asked how you can improve your grade. I have added all work to the computer that has been turned in to me. **NO MORE MAKE UP WORK WILL BE ACCEPTED UNDER ANY CIRCUMSTANCE**.

Here is how you can raise your grade.... **Complete your AMI packets.** You can take a picture and email it to me, Remind/text it to me, or drop it off at the school. As I receive them I will add them to the computer.

Please pass the word to your friends about this letter. I don't want to skip anyone. If the worksheets cannot be printed, write the answers on a piece of paper. If you have ANY QUESTIONS, CONTACT ME. I don't mind at all...remember my quote I always say, "I get paid to answer questions."

ONE LAST THING! I AM MISSING CALCULATORS #26 AND #29.

I NEED THEM AS SOON AS POSSIBLE!

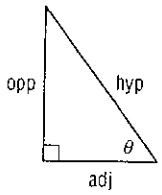
AMI Trigonometry: Day 16

Right Triangle Trigonometry

Values of Trigonometric Ratios The side lengths of a right triangle and a reference angle θ can be used to form six **trigonometric ratios** that define the **trigonometric functions** known as **sine**, **cosine**, and **tangent**. The **cosecant**, **secant**, and **cotangent** ratios are reciprocals of the sine, cosine, and tangent ratios, respectively. Therefore, they are known as **reciprocal functions**.

Let θ be an acute angle in a right triangle and the abbreviations opp, adj, and hyp refer to the lengths of the side opposite θ, the side adjacent to θ, and the hypotenuse, respectively.

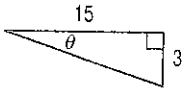
Then the six trigonometric functions of θ are defined as follows.



$\text{sine } (\theta) = \sin\theta = \frac{\text{opp}}{\text{hyp}}$ $\quad \text{cosine } (\theta) = \cos\theta = \frac{\text{adj}}{\text{hyp}}$ $\quad \text{tangent } (\theta) = \tan\theta = \frac{\text{opp}}{\text{adj}}$

$\text{cosecant } (\theta) = \csc\theta = \frac{\text{hyp}}{\text{opp}}$ $\quad \text{secant } (\theta) = \sec\theta = \frac{\text{hyp}}{\text{adj}}$ $\quad \text{cotangent } (\theta) = \cot\theta = \frac{\text{adj}}{\text{opp}}$

Example **Find the exact values of the six trigonometric functions of θ.**



Use the Pythagorean Theorem to determine the length of the hypotenuse.

$15^2 + 3^2 = c^2$ $\quad a = 15, b = 3$

$234 = c^2$ $\quad$ Simplify.

$c = \sqrt{234}$ or $3\sqrt{26}$ $\quad$ Take the positive square root.

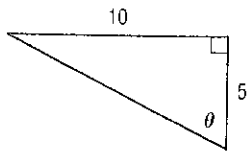
$\sin\theta = \frac{\text{opp}}{\text{hyp}} = \frac{3}{3\sqrt{26}}$ or $\frac{\sqrt{26}}{26}$ $\quad \cos\theta = \frac{\text{adj}}{\text{hyp}} = \frac{15}{3\sqrt{26}}$ or $\frac{5\sqrt{26}}{26}$ $\quad \tan\theta = \frac{\text{opp}}{\text{adj}} = \frac{3}{15}$ or $\frac{1}{5}$

$\csc\theta = \frac{\text{hyp}}{\text{opp}} = \frac{3\sqrt{26}}{3}$ or $\sqrt{26}$ $\quad \sec\theta = \frac{\text{hyp}}{\text{adj}} = \frac{3\sqrt{26}}{15}$ or $\frac{\sqrt{26}}{5}$ $\quad \cot\theta = \frac{\text{adj}}{\text{opp}} = \frac{15}{3}$ or 5

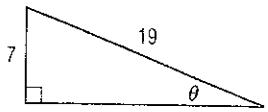
Exercises

Find the exact values of the six trigonometric functions of θ.

1.



2.



Use the given trigonometric function value of the acute angle θ to find the exact values of the five remaining trigonometric function values of θ.

3. $\sin\theta = \frac{3}{7}$

4. $\sec\theta = \frac{8}{5}$

AMI Trigonometry: Day 17

Degrees and Radians

Angles and Their Measures One complete rotation can be represented by 360° or 2π radians. Thus, the following formulas can be used to relate **degree** and **radian** measures.

Degree/Radian Coversion Rules	
$1^\circ = \frac{\pi}{180}$ radians	1 radian $= \left(\frac{180}{\pi}\right)^\circ$

If two angles have the same initial and terminal sides, but different measures, they are called **coterminal angles**.

Example **Write each degree measure in radians as a multiple of π and each radian measure in degrees.**

a. 36°

$36^\circ = 36^\circ\left(\frac{\pi \text{ radians}}{180^\circ}\right)$ Multiply by $\frac{\pi \text{ radians}}{180^\circ}$.

$= \frac{\pi}{5}$ radians or $\frac{\pi}{5}$ Simplify.

b. $-\frac{17\pi}{3}$

$-\frac{17\pi}{3} = -\frac{17\pi}{3}$ radians Multiply by $\frac{180^\circ}{\pi \text{ radians}}$.

$= -\frac{17\pi}{3}$ radians $\left(\frac{180^\circ}{\pi \text{ radians}}\right) = -1020^\circ$ Simplify.

Exercises

Write each degree measure in radians as a multiple of π and each radian measure in degrees.

1. -250° **2.** 6° **3.** -145°

4. 870° **5.** 18° **6.** -820°

7. 4π **8.** $\frac{13\pi}{30}$ **9.** -1

10. $\frac{3\pi}{16}$ **11.** -2.56 **12.** $-\frac{7\pi}{9}$

AMI Trigonometry: Day 18

Degrees and Radians

Applications with Angle Measure The rate at which an object moves along a circular path is called its **linear speed**. The rate at which the object rotates about a fixed point is called its **angular speed**.

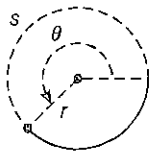
Suppose an object moves at a constant speed along a circular path of radius r.

If s is the arc length traveled by the object during time t, then the object's *linear speed* v is given by

$$v = \frac{s}{t}.$$

If θ is the angle of rotation (in radians) through which the object moves during time t, then the *angular speed* ω of the object is given by

$$\omega = \frac{\theta}{t}.$$



Example **Determine the angular speed and linear speed if 8.2 revolutions are completed in 3 seconds and the distance from the center of rotation is 7 centimeters. Round to the nearest tenth.**

The angle of rotation is $8.2 \times 2\pi$ or 16.4π radians.

$\omega = \frac{\theta}{t}$ Angular speed

$= \frac{16.4\pi}{3}$ $\theta = 16.4\pi$ radians and $t = 3$ seconds

≈ 17.17403984 Use a calculator.

Therefore, the angular speed is about 17.2 radians per second.

The linear speed is $\frac{r\theta}{t}$.

$v = \frac{s}{t}$ Linear speed

$= \frac{r\theta}{t}$ $s = r\theta$

$= \frac{7(16.4\pi)}{3}$ $r = 7$ centimeters, $\theta = 16.4\pi$ radians, and $t = 3$ seconds

$= 120.218278877$ Use a calculator.

Therefore, the linear speed is about 120.2 centimeters per second.

Exercises

Find the rotation in revolutions per minute given the angular speed and the radius given the linear speed and the rate of rotation.

1. $\omega = 2.7$ rad/s

2. $\omega = \frac{4}{3}\pi$ rad/hr

3. $\omega = \frac{3}{2}\pi$ rad/min

4. $v = 24.8$ m/s, 120 rev/min

5. $v = 118$ ft/min, 3.6 rev/s

6. $v = 256$ in./h, 0.5 rev/min

AMI Trigonometry: Day 19

Trigonometric Functions on the Unit Circle

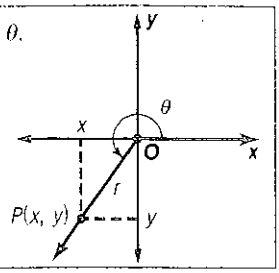
Trigonometric Functions of Any Angle The definitions of the six trigonometric functions may be extended to include any angle as shown below.

Let θ be any angle in standard position and point $P(x, y)$ be a point on the terminal side of θ. Let r represent the nonzero distance from P to the origin. That is, let $r = \sqrt{x^2 + y^2} \neq 0$. Then the trigonometric functions of θ are as follows.

$\sin \theta = \frac{y}{r}$ $\quad$ $\csc \theta = \frac{r}{y}, y \neq 0$

$\cos \theta = \frac{x}{r}$ $\quad$ $\sec \theta = \frac{r}{x}, x \neq 0$

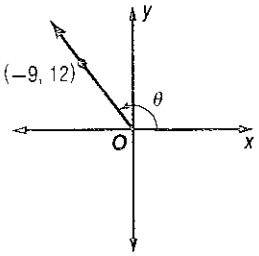
$\tan \theta = \frac{y}{x}, x \neq 0$ $\quad$ $\cot \theta = \frac{x}{y}, y \neq 0$



You can use the following steps to find the value of a trigonometric function of any angle θ.

1. Find the reference angle θ'.
2. Find the value of the trigonometric function for θ'.
3. Use the quadrant in which the terminal side of θ lies to determine the sign of the trigonometric function value of θ.

Example **Let $(-9, 12)$ be a point on the terminal side of an angle θ in standard position. Find the exact values of the six trigonometric functions of θ.**



Use the values of x and y to find r.

$r = \sqrt{x^2 + y^2}$ Pythagorean Theorem

$= \sqrt{(-9)^2 + 12^2}$ $x = -9$ and $y = 12$

$= \sqrt{225}$ or 15 Take the positive square root.

Use $x = -9, y = 12$, and $r = 15$ to write the six trigonometric ratios.

$\sin \theta = \frac{y}{r} = \frac{12}{15}$ or $\frac{4}{5}$ $\quad$ $\cos \theta = \frac{x}{r} = \frac{-9}{15}$ or $-\frac{3}{5}$ $\quad$ $\tan \theta = \frac{y}{x} = \frac{12}{-9}$ or $-\frac{4}{3}$

$\csc \theta = \frac{r}{y} = \frac{15}{12}$ or $\frac{5}{4}$ $\quad$ $\sec \theta = \frac{r}{x} = \frac{15}{-9}$ or $-\frac{5}{3}$ $\quad$ $\cot \theta = \frac{x}{y} = \frac{-9}{12}$ or $-\frac{3}{4}$

Exercises

The given point lies on the terminal side of an angle θ in standard position. Find the values of the six trigonometric functions of θ.

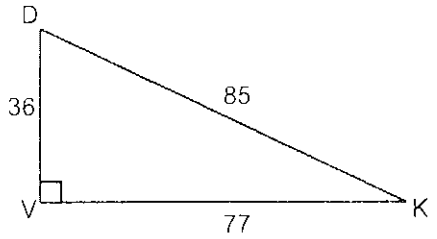
1. $(2, -5)$ $\quad$ 2. $(12, 4)$ $\quad$ 3. $(-3, -8)$

AMI Trigonometry: Day 20

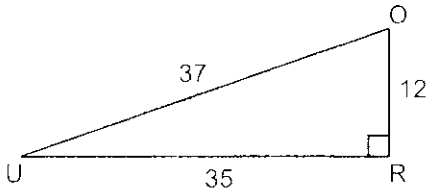
Trigonometric Ratios

Find the given trigonometric ratio. The answer will be in fraction form.

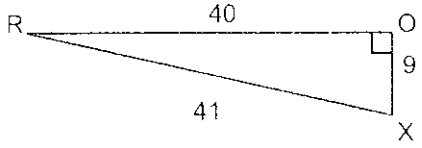
1) sin D = _____



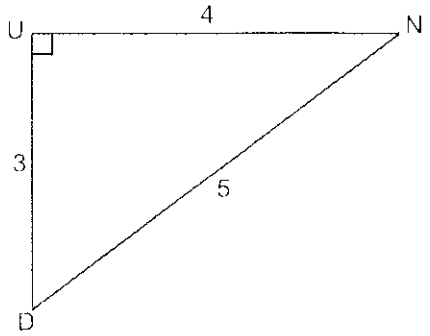
2) cos U = _____



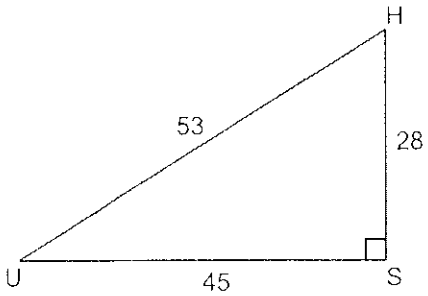
3) sin R = _____



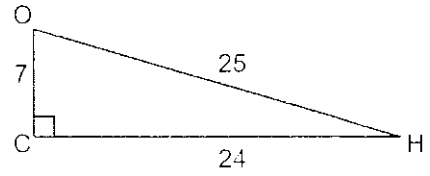
4) tan N = _____



5) tan H = _____



6) cos H = _____

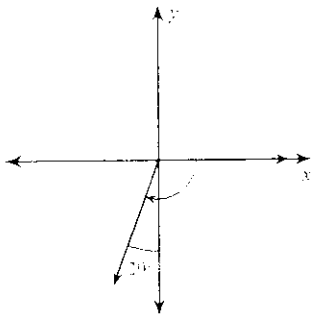


AMI Trigonometry: Day 21

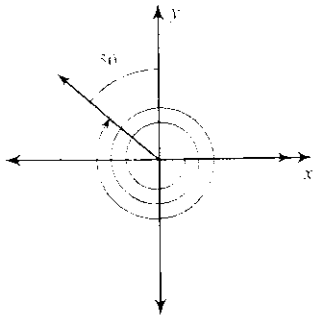
Angles and Angle Measure

Find the measure of each angle.

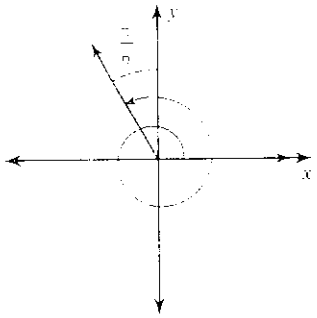
1)



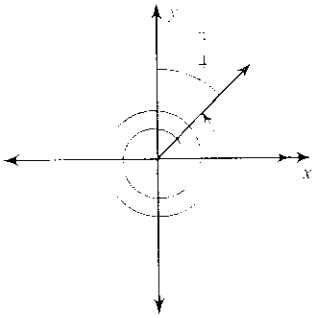
2)



3)

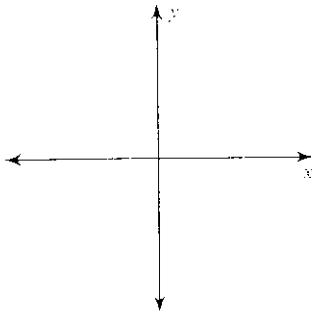


4)

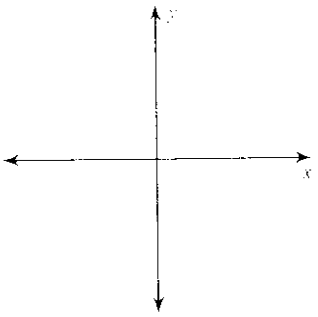


Draw an angle with the given measure in standard position.

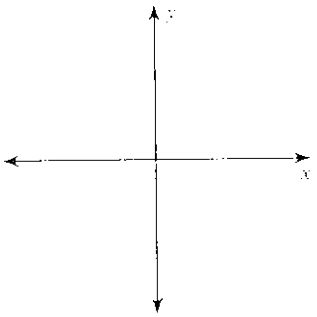
5) $-\frac{5\pi}{4}$



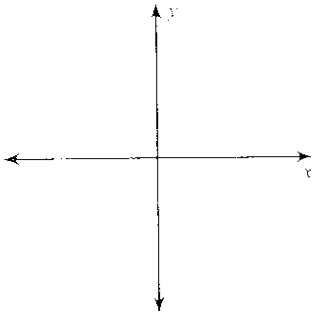
6) $-\frac{47\pi}{18}$



7) 170°



8) 510°



AMI Trigonometry: Day 22

* Look at log ... for ...

Convert each degree measure into radians.

15) $240°$

16) $315°$

17) $125°$

18) $-340°$

Convert each radian measure into degrees.

19) $\frac{19\pi}{4}$

20) $\frac{\pi}{4}$

21) $-\frac{43\pi}{18}$

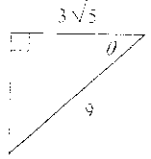
22) $-\frac{31\pi}{18}$

AMI Trigonometry: Day 23

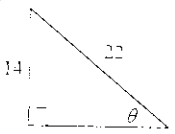
Find the missing side by using the Pythagorean Thm.

Find the value of the trig function indicated.

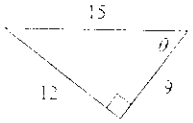
3) csc θ



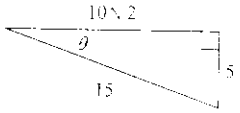
4) tan θ



5) tan θ



6) sec θ

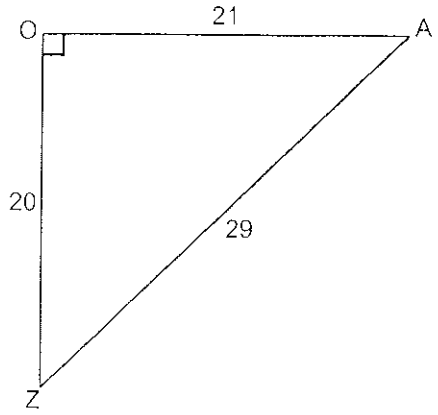


AMI Trigonometry: Day 24

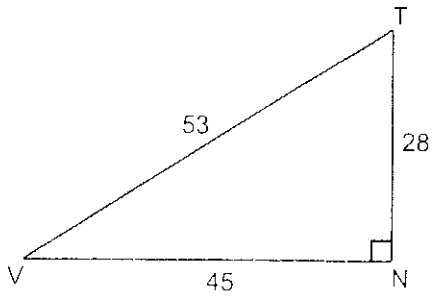
Trigonometric Ratios

Find the given trigonometric ratio. The answer will be in fraction form.

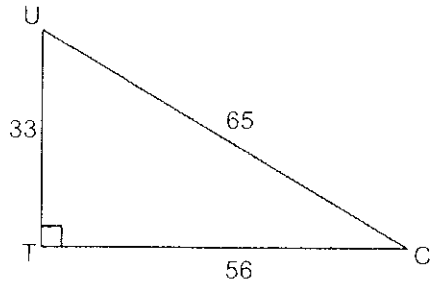
1) sin A = _____



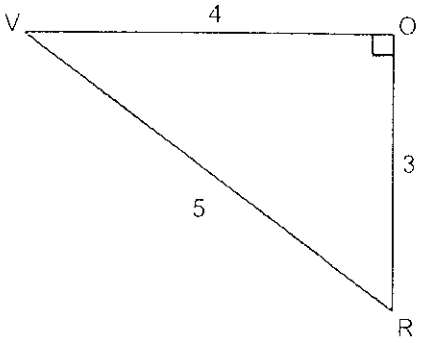
2) tan V = _____



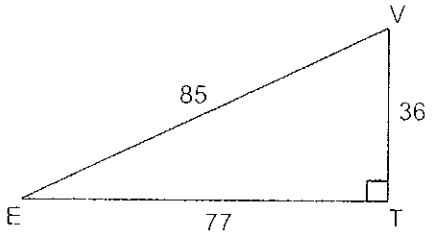
3) sin C = _____



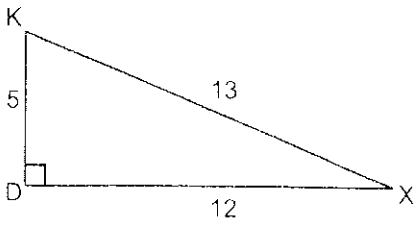
4) cos R = _____



5) cos V = _____



6) tan X = _____



AMI Trigonometry: Day 25

Exercises

1. Convert each of the following angles given in degrees, to radians. Give your answers correct to 2 decimal places.

a) $32°$. b) $95°$. c) $217°$.

2. Convert each of the following angles given in radians, to degrees. Give your answers correct to 2 decimal places.

a) 3 radians. b) 2.4 radians. c) 1 radian.

3. Convert each of the following angles given in radians, to degrees.

a) $\frac{\pi}{15}$. b) $\frac{\pi}{5}$.

4. Convert the following angles given in degrees, to radians.
your answers as multiples of π.

a) $90°$. b) $72°$. c) $-45°$.