READY

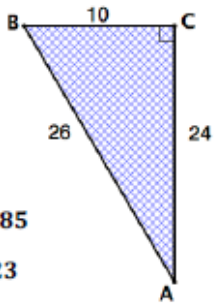
Topic: Finding the trigonometric ratios in a right triangle

Use the given measures on the triangle to write the indicated trig value. Write them as a fraction. Then write them as a decimal rounded to the thousandths place.

1. $\sin A =$

   $\cos A =$

   $\tan A =$



Answer:

$\sin A = \frac{5}{13} = 0.385$

$\cos A = \frac{12}{13} = 0.923$

$\tan A = \frac{5}{12} = 0.417$

2. $\sin B =$

   $\cos B =$

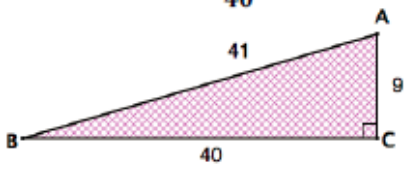
   $\tan B =$

Answer:

$\sin B = \frac{9}{41} = 0.220$

$\cos B = \frac{40}{41} = 0.976$

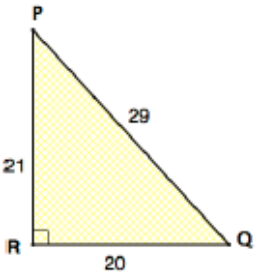
$\tan B = \frac{9}{40} = 0.225$



3. $\sin P =$

   $\cos P =$

   $\tan P =$



Answer:

$\sin P = \frac{20}{29} \approx 0.690$

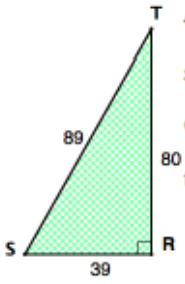
$\cos P = \frac{21}{29} \approx 0.724$

$\tan P = \frac{20}{21} \approx 0.952$

4. $\sin S =$

   $\cos S =$

   $\tan S =$



Answer:

$\sin S = \frac{80}{89} \approx 0.899$

$\cos S = \frac{39}{89} \approx 0.438$

$\tan S = \frac{80}{39} \approx 2.051$

5. Which trigonometric ratio is **exact**, the fraction or the decimal? Explain.

   Answer: The fraction is exact and most of the decimals are rounded to the thousandths place.

6. My calculator tells me that $\frac{\sqrt{2}}{2} = 0.7071067812$. Is one value more accurate than the other? Explain.

   Answer: The fraction is exact. The decimal is still an approximation since an irrational number never ends and the decimal has been rounded.

SET

Topic: Exploring applications of volume, weight and density

Answer the following questions about the grain stored in the storage silos.

7. The figure at the right is of 2 grain, storage silos. The diameter of each measures 24 feet and the height of the cylinder measures 51 feet. The height of the cone adds an additional 12 feet. Find the total volume of one silo.

Answer: 24881.41 ft³ (using π)
24868.8 ft³ (using 3.14)

8. How many bushels of grain will each silo be able to store, if a bushel is 1.244 cubic feet? (Assume it can be filled to the top.)

Answer: 20001.14 bushels (using π) or
19991 bushels (using 3.14)

9. Density relates to the degree of compactness of a substance. A cubic inch of gold weighs a great deal more than a cubic inch of wood because gold is more dense than wood. The density of grains also varies. Use the information below to calculate how many tons of each grain can be stored in one silo. (1 ton = 2000 lbs.)

1 bushel of oats weighs 32 pounds — **Answer: 320.02 tons (using π) or 319.86 tons (using 3.14)**

1 bushel of barley weighs 48 pounds — **Answer: 480.03 tons (using π) or 479.78 tons (using 3.14)**

1 bushel of wheat weighs 60 pounds — **Answer: 600.03 tons (using π) or 599.73 tons (using 3.14)**

10. A ¾ -ton pickup has the capacity to haul a little more than 1500 lbs. If the hauling bed of the pickup measures 4 ft. by 6.5 ft. by 2 ft., can a ¾ -ton pickup safely haul a full (level) load of oats, barley, or wheat? Justify your answer for each type of grain.

Answer: Volume of the truck is 52 ft³. That will hold 41.8 bushels. 41.8 bushels of oats is 1337.6 lbs., barley is 2006.4 lbs., and wheat is 2508 lbs. so the truck can only carry the oats safely.

GO

Topic: Forms of linear and quadratic functions

Write what you know about the function (including end-behavior) and then graph it.

11.	Equation: $f(x) = (x-2)(x+3)$	Graph:

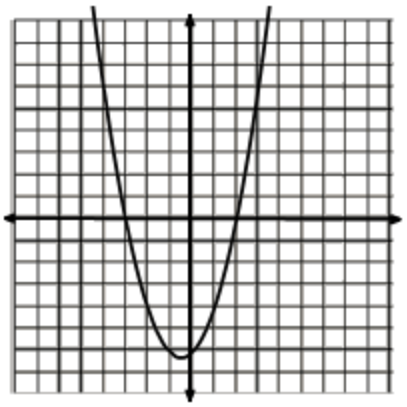
What I know about this function:

Possible answers:
Minimum at (-.5, -6.25),
x-intercepts at (2,0) and (-3,0)
y-int. at (0, -6)
Domain: $(-\infty, \infty)$, **Range** $(-6.25, \infty)$
Decreasing: $(-\infty, -0.5)$, **Inc. :** $(-0.5, \infty)$

End behavior:

$as\ \ x \to -\infty, \quad f(x) \to \underline{\infty}$

$as\ \ x \to \ \infty, \quad f(x) \to \underline{\infty}$



12.	Equation: $g(x) = x^2 + 6x + 9$	Graph:

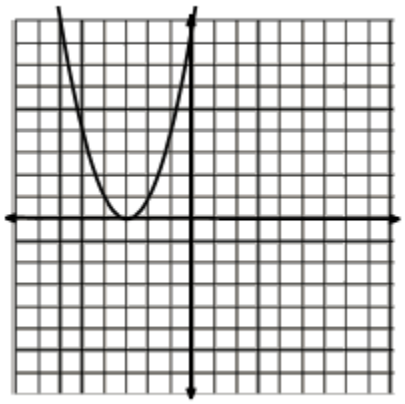
What I know about this function:

Possible answers:
Minimum at (-3, 0),
x-intercepts at (-3,0)
y-int. at (0, 9)
Domain: $(-\infty, \infty)$, **Range** $(-3, \infty)$
Decreasing: $(-\infty, -3)$, **Inc. :** $(-3, \infty)$

End behavior:

$as\ \ x \to -\infty, \quad f(x) \to \underline{\infty}$

$as\ \ x \to \ \infty, \quad f(x) \to \underline{\infty}$



13.	Equation: $y = -x^2 - 4$	Graph:

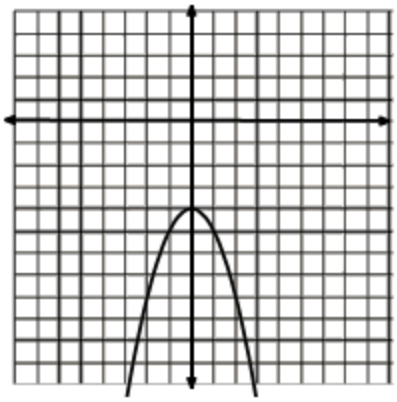
What I know about this function:

Possible answers:
Maximum at (0,-4),
No x-intercepts
y-int. at (0,-4)
Domain: $(-\infty, \infty)$, **Range** $(-\infty, -4)$
Increasing: $(-\infty, 0)$, **Dec. :** $(0, \infty)$

End behavior:

$as\ \ x \to -\infty, \quad f(x) \to \underline{-\infty}$

$as\ \ x \to \ \infty, \quad f(x) \to \underline{-\infty}$



14.	Equation: $h(x) = 2(x - 5) + 3$	Graph:

What I know about this function:

Possible answers:
Linear, no max or min,
x-intercept at (3.5, 0)
y-int. at (0,-7)
Domain: $(-\infty, \infty)$, **Range** $(-\infty, \infty)$
Increasing: $(-\infty, \infty)$

End behavior:

$as\ \ x \to -\infty, \quad f(x) \to \underline{-\infty}$

$as\ \ x \to \ \infty, \quad f(x) \to \underline{\infty}$