

Trigonometric Ratios Study Guide

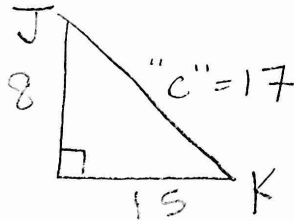
Sine $\theta = \frac{\text{opposite}}{\text{hypotenuse}}$ Cosine $\theta = \frac{\text{adjacent}}{\text{hypotenuse}}$ Tangent $\theta = \frac{\text{opposite}}{\text{adjacent}}$

1. What does it mean for two angles to be complementary?

add to 90°

② $\tan 34 = .67$
 $\cos^{-1}(.906307787) = 25^\circ$

2. Angle J and angle K are complementary angles in a right triangle. The value of $\tan J$ is $\frac{15}{8}$. What is the value of $\sin J$?

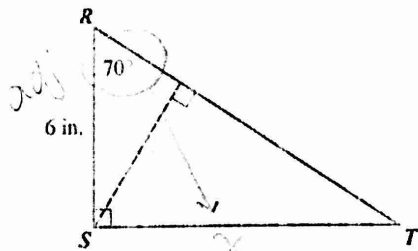


$8^2 + 15^2 = c^2$
 $17 = c$

$\sin J = \frac{15}{17}$

3. Triangle RST is a right triangle with right angle S, as shown. What is the area of triangle RST?

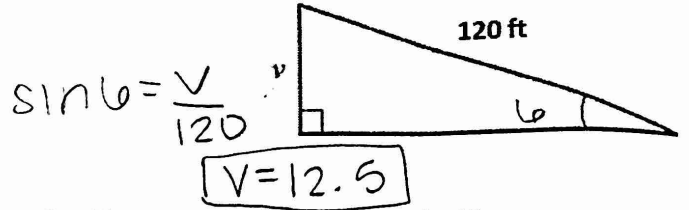
$\frac{1}{2}bh$
 $h = 6$
 we need to find base first



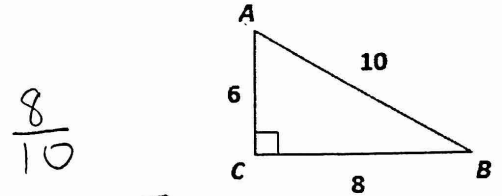
$\tan 70 = \frac{x}{6}$
 $16.5 = x$

so
 $A = \frac{1}{2}(16.5)(6)$
 $A = 49.5$

4. A road ascends a hill at an angle of 6° . For every 120 feet of road, how many feet does the road ascend?



5. Given triangle ABC, what is $\sin A$?

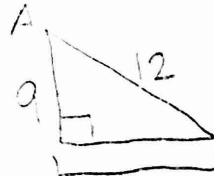


$\frac{8}{10}$

$\frac{4}{5}$

always simplify your ratios

6. In a right triangle, if $\cos A = \frac{9}{12}$, what is $\sin A$?



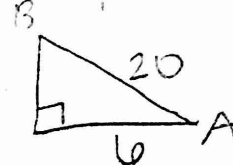
$12^2 = 9^2 + b^2$
 $144 = 81 + b^2$
 $b^2 = 63$
 $b = 3\sqrt{7}$

find this first = $3\sqrt{7}$ so $\sin A = \frac{3\sqrt{7}}{12}$

*these aren't equal

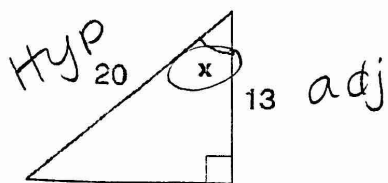
7. In right triangle ABC, if $\angle A$ and $\angle B$ are the acute angles, and $\sin B = \frac{6}{20}$, what is $\cos A$?

these will be equal
 *you can draw a picture if you want



$\cos A = \frac{6}{20}$

8. Find the measure of angle x . Round your answer to the nearest degree.

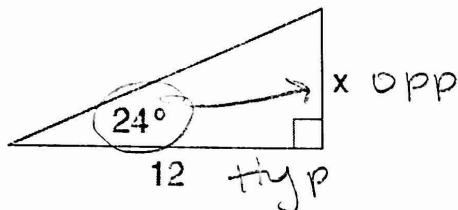


$$\cos x = \frac{13}{20}$$

$$\cos^{-1}\left(\frac{13}{20}\right) = x$$

$$x = 49.5^\circ$$

9. Solve for x .



$$\sin 24 = \frac{x}{12}$$

$$x = 12 \cdot \sin 24$$

$$x = 4.9$$

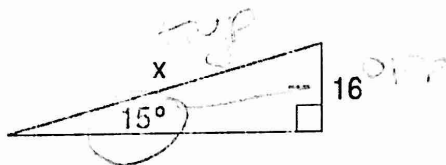
10. You are given that $\tan B = \frac{19}{11}$. What is the measure of angle B?

use inverse

$$\tan^{-1}\left(\frac{19}{11}\right)$$

$$B = 59.9^\circ$$

11. Solve for x .

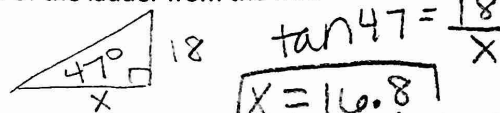


$$\sin 15 = \frac{16}{x}$$

$$x = \frac{16}{\sin 15}$$

$$x = 61.8$$

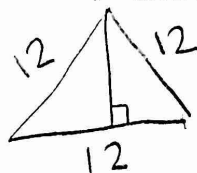
12. A ladder is leaning against a house so that the top of the ladder is 18 feet above the ground. The angle with the ground is 47° . How far is the base of the ladder from the house?



$$\tan 47 = \frac{18}{x}$$

$$x = 16.8$$

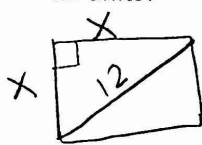
13. Given an equilateral triangle has a perimeter of 36 cm, what is the length of its altitude?



$$\sin 60 = \frac{x}{12}$$

$$x = 10.4$$

14. What is the area of a square with a diagonal of 12 units?



$$x^2 + x^2 = 12^2$$

$$2x^2 = 144$$

$$x^2 = 72$$

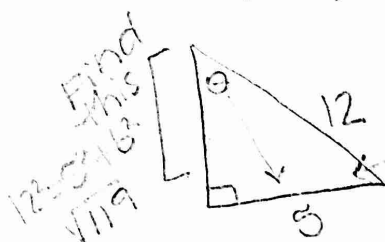
$$x = 6\sqrt{2}$$

$$A = x^2$$

$$A = (6\sqrt{2})^2$$

$$A = 72$$

15. Give a right triangle FUN and $\sin \theta = 5/12$, find $\sin(90 - \theta)$ and $\cos(90 - \theta)$.



Find this angle is "90 - theta"

$$\sin(90 - \theta) = \frac{\sqrt{119}}{12}$$

$$\cos(90 - \theta) = \frac{5}{12}$$

DON'T FORGET YOU NEED TO BE ABLE TO SOLVE FOR A RIGHT TRIANGLE GIVEN 2 SIDES OR GIVEN AN ANGLE AND A SIDE. (Problems like this came from the worksheet we did yesterday in class)

- IF YOU ARE GIVEN 2 SIDES, USE THE PYTHAGOREAN THEOREM TO FIND THE THIRD SIDE AND THEN INVERSE TRIG RATIOS TO FIND THE ANGLES.
- IF YOU ARE GIVEN ONE SIDE AND ONE ANGLE, THEN YOU WILL HAVE TO USE TRIG RATIOS TO FIND ONE OF THE TWO REMAINING SIDES AND THEN YOU CAN USE PYTHAGOREAN THEOREM TO FIND THE THIRD.

*Look back over old worksheets, mini touchstones and notes to solve more practice problems!

*LOOK @ phyt. word problems *