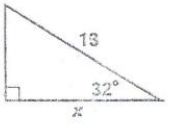
Name Key Date Class

Lesson 4 Worksheet 1
Using trig ratios to solve for a side in a right triangle

Solve for x in each triangle below. Use what you learned in lesson 3 to first identify the ratio, then write the equation, and then solve the equation. Make sure your calculator is in degree mode. Round your answers to 2 decimal places.

1.

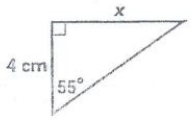


$\cos 32 = \frac{x}{13}$

$13\cos 32 = x$

$11.0 = x$

2.

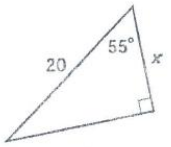


$\tan 55 = \frac{x}{4}$

$4\tan 55 = x$

$5.7 = x$

3.

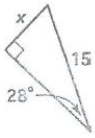


$\cos 55 = \frac{x}{20}$

$20\cos 55 = x$

$11.5 = x$

4.

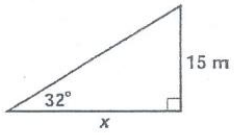


$\sin 28 = \frac{x}{15}$

$15\sin 28 = x$

$7.0 = x$

5.

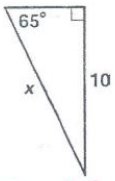


$\tan 32 = \frac{15}{x}$

$x = \frac{15}{\tan 32}$

$x = 24.0$

6.

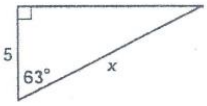


$\sin 65 = \frac{10}{x}$

$x = \frac{10}{\sin 65}$

$x = 11.0$

7.

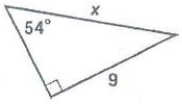


$\cos 63 = \frac{5}{x}$

$x = \frac{5}{\cos 63}$

$x = 11.0$

8.

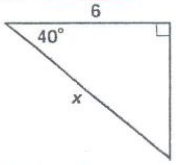


$\sin 54 = \frac{9}{x}$

$x = \frac{9}{\sin 54}$

$x = 11.1$

9.

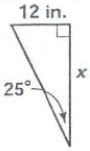


$\cos 40 = \frac{6}{x}$

$x = \frac{6}{\cos 40}$

$x = 7.8$

10.

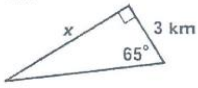


$\tan 25 = \frac{12}{x}$

$x = \frac{12}{\tan 25}$

$x = 25.7$

11.

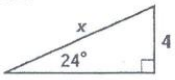


$\tan 65 = \frac{x}{3}$

$3\tan 65 = x$

$6.4 = x$

12.



$\sin 24 = \frac{4}{x}$

$x = \frac{4}{\sin 24}$

$x = 9.8$

Name Key Date Class

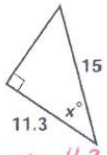
Lesson 4 Worksheet 2
Using inverse trig ratios to solve for an angle in a right triangle

Part I: Use your calculator and inverse trig functions to find the angle for each ratio below to the nearest tenth (round to 1 decimal place).

1. $\sin^{-1} .86 =$ 59.3°
2. $\sin^{-1} \frac{5}{8} =$ 38.7°
3. $\sin^{-1} .5 =$ 30°
4. $\sin x = \frac{3}{4}$, $x =$ 48.6°
5. $\cos^{-1} .72 =$ 43.9°
6. $\cos^{-1} \frac{1}{8} =$ 82.8°
7. $\cos^{-1} .3 =$ 72.5°
8. $\cos x = \frac{1}{2}$, $x =$ 60°
9. $\tan^{-1} .53 =$ 27.9°
10. $\tan^{-1} 2 =$ 63.4°
11. $\tan^{-1} 4.6 =$ 77.7°
12. $\tan x = \frac{7}{8}$, $x =$ 41.2°

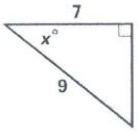
Part II: Solve for x in each triangle below. Use what you learned in lesson 3 to first identify the ratio, then write the equation, and then solve the equation. Make sure your calculator is in degree mode. Round your answers to the nearest tenth.

1.



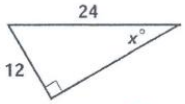
$\cos X = \frac{11.3}{15}$
$X = \cos^{-1}(11.3/15)$
$X = 41.1°$

2.



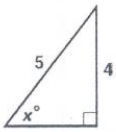
$\cos X = \frac{7}{9}$
$X = \cos^{-1}(7/9)$
$X = 38.9°$

3.



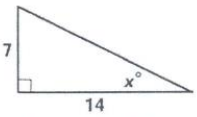
$\sin X = \frac{12}{24}$
$X = \sin^{-1}(12/24)$
$X = 30°$

4.



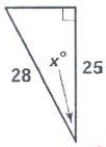
$\sin X = \frac{4}{5}$
$X = \sin^{-1}(4/5)$
$X = 53.1°$

5.



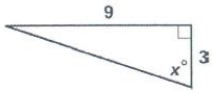
$\tan X = \frac{7}{14}$
$X = \tan^{-1}(7/14)$
$X = 26.6°$

6.



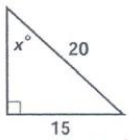
$\cos X = \frac{25}{28}$
$X = \cos^{-1}(25/28)$
$X = 26.8°$

7.



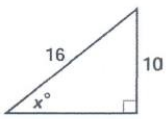
$\tan X = \frac{9}{3}$
$X = \tan^{-1}(9/3)$
$X = 71.6°$

8.



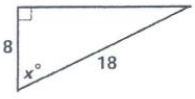
$\sin X = \frac{15}{20}$
$X = \sin^{-1}(15/20)$
$X = 48.6°$

9.



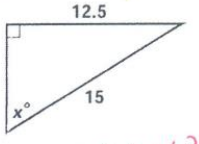
$\sin X = \frac{10}{16}$
$X = \sin^{-1}(10/16)$
$X = 38.7°$

10.



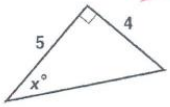
$\cos X = \frac{8}{18}$
$X = \cos^{-1}(8/18)$
$X = 63.6°$

11.

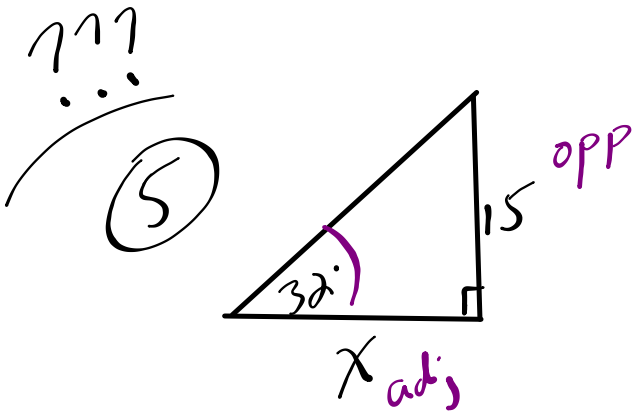


$\sin X = \frac{12.5}{15}$
$X = \sin^{-1}(12.5/15)$
$X = 56.4°$

12.



$\tan X = \frac{4}{5}$
$X = \tan^{-1}(4/5)$
$X = 38.7°$



SOH CAH TOA

$x \tan 32° = 15$

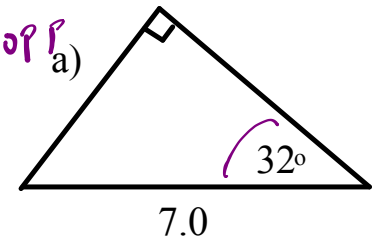
$\frac{x \tan 32°}{\tan 32°} = \frac{15}{x}$

$x = \frac{15}{\tan 32°}$

$x = 24.0$

Warm Up...

a)



b) Find angle B given... sin B = 0.8051

c) Find angle C given... tan C = $\frac{7}{4}$

opp

hyp

$7 \sin 32° = \frac{a}{7}(7)$

$3.7 = a$

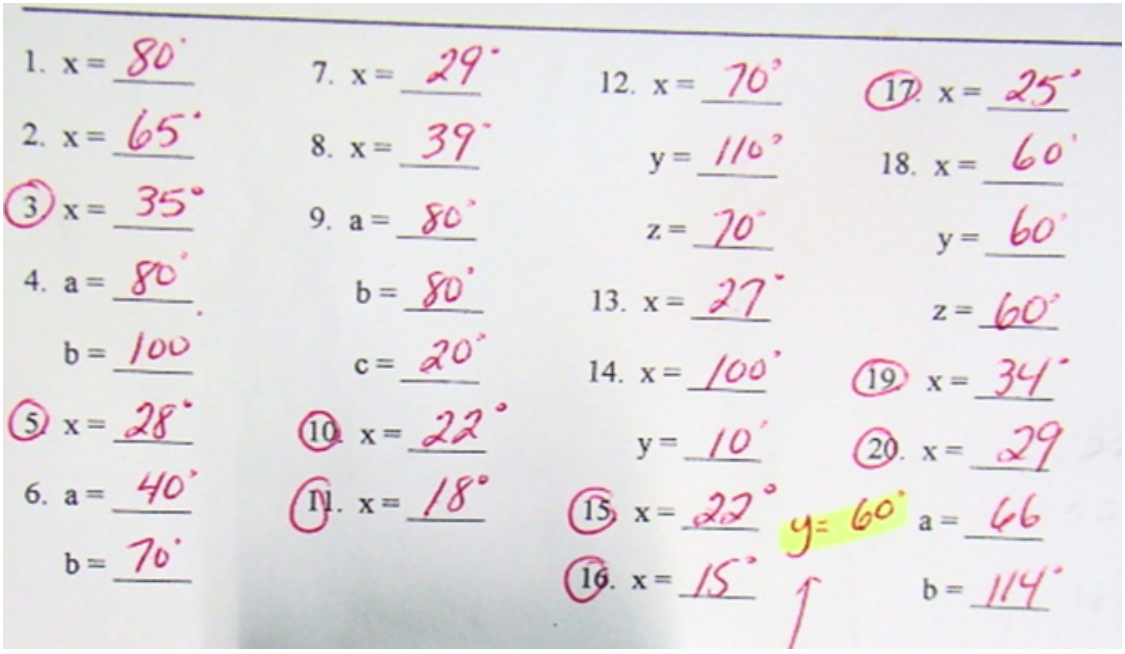
b) $\sin^{-1}$ $\sin B = (0.8051)$ $\sin^{-1}$

$\angle B = 54°$

c) $\tan^{-1}$ $\tan C = \left(\frac{7}{4}\right)$ $\tan^{-1}$

$\angle C = 60°$

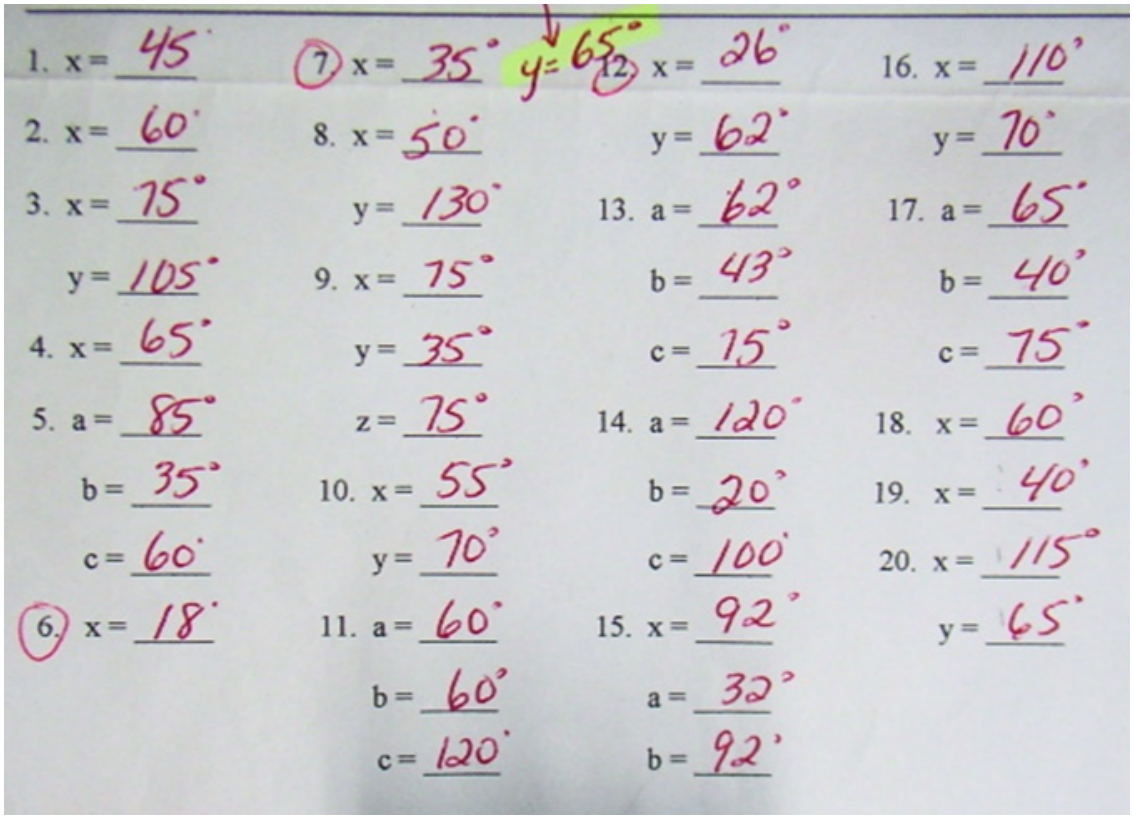
Assignment Solutions...Front page



1. x = 80°
2. x = 65°
3. x = 35°
4. a = 80°, b = 100
5. x = 28°
6. a = 40°, b = 70°
7. x = 29°
8. x = 39°
9. a = 80°, b = 80°, c = 20°
10. x = 22°
11. x = 18°
12. x = 70°, y = 110°, z = 70°
13. x = 27°
14. x = 100°, y = 10°
15. x = 22°
16. x = 15°
17. x = 25°
18. x = 60°, y = 60°, z = 60°
19. x = 34°
20. x = 29, a = 66, b = 114°

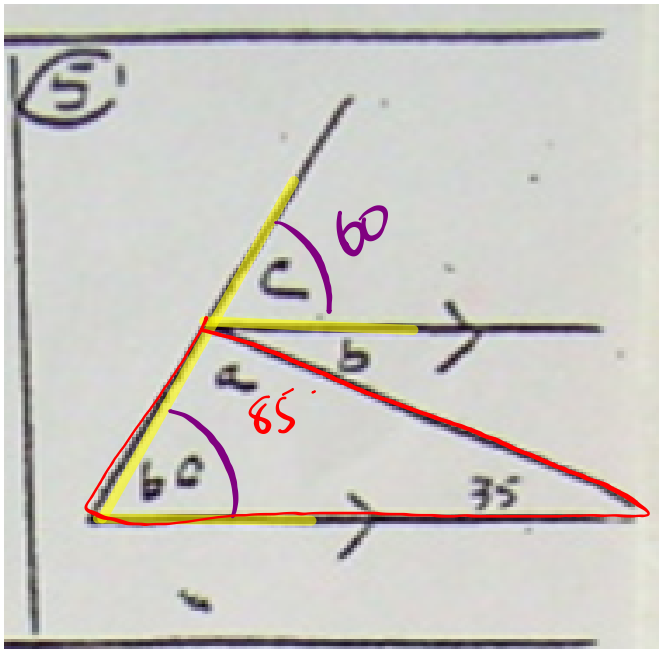
y = 60°

Back page...

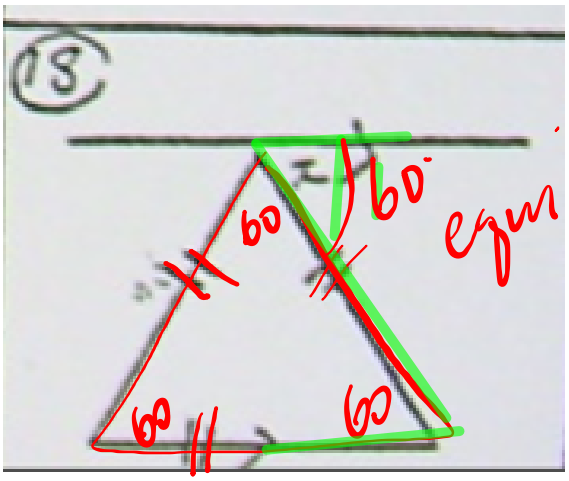


1. x = 45°
2. x = 60°
3. x = 75°, y = 105°
4. x = 65°
5. a = 85°, b = 35°, c = 60°
6. x = 18°
7. x = 35°
8. x = 50°, y = 130°
9. x = 75°, y = 35°, z = 75°
10. x = 55°, y = 70°
11. a = 60°, b = 60°, c = 120°
12. x = 26°, y = 62°
13. a = 62°, b = 43°, c = 75°
14. a = 120°, b = 20°, c = 100°
15. x = 92°, a = 32°, b = 92°
16. x = 110°, y = 70°
17. a = 65°, b = 40°, c = 75°
18. x = 60°
19. x = 40°
20. x = 115°, y = 65°

y = 65°



$c = 60°$
$a = 85°$
$b = 35°$



equilateral
$x = 60°$

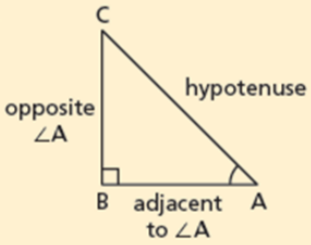
In a right triangle, the ratios that relate each leg to the hypotenuse depend only on the measure of the acute angle, and not on the size of the triangle. These ratios are called the **sine ratio** and the **cosine ratio**.

The sine ratio for $\angle A$ is written as sin A and the cosine ratio for $\angle A$ is written as cos A.

The Sine Ratio

If $\angle A$ is an acute angle in a right triangle, then

$$\sin A = \frac{\text{length of side opposite } \angle A}{\text{length of hypotenuse}}$$

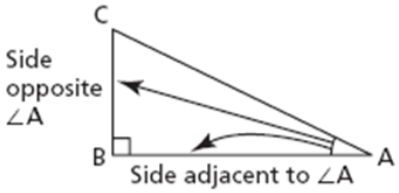


The Cosine Ratio

If $\angle A$ is an acute angle in a right triangle, then

$$\cos A = \frac{\text{length of side adjacent to } \angle A}{\text{length of hypotenuse}}$$

We name the sides of a right triangle in relation to one of its acute angles.



The ratio

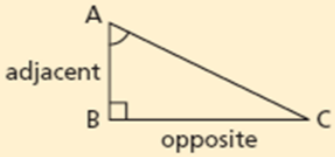
Length of side opposite ∠A : Length of side adjacent to ∠A

is called the **tangent ratio** of ∠A.

The Tangent Ratio

If ∠A is an acute angle in a right triangle, then

$$\tan A = \frac{\text{length of side opposite } \angle A}{\text{length of side adjacent to } \angle A}$$



HOMEWORK...

Puzzle Worksheet - Finding an Unknown Side with Trig.pdf

Puzzle Worksheet - Finding an Unknown Angle with Trig.pdf

Attachments

Puzzle Worksheet - Finding an Unknown Angle with Trig.pdf

Puzzle Worksheet - Finding an Unknown Side with Trig.pdf