Advanced Algebra   Name _____

Homework 6.1

Right Triangle Trigonometry   Period _____
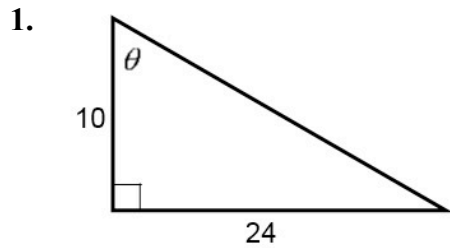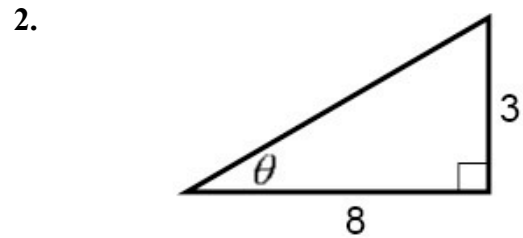
SHOW ALL WORK.

Complete Parts A & B OR Parts B & C

<u>**PART A:**</u>

Evaluate the six trigonometric functions of the angle θ. *Leave answers in fraction form.*

1.

10

24

sin θ = _____   cos θ = _____   tan θ = _____

csc θ = _____   sec θ = _____   cot θ = _____

2.

3

8

sin θ = _____   cos θ = _____   tan θ = _____

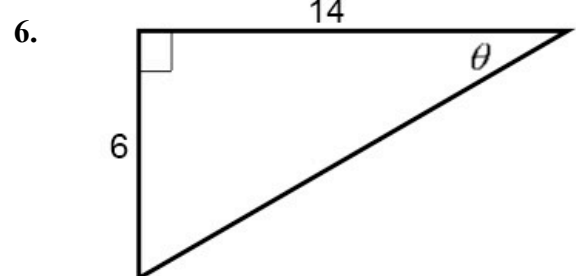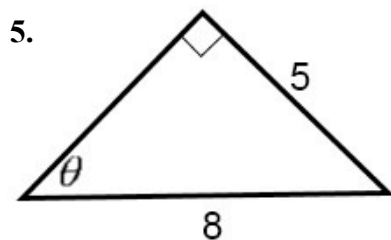csc θ = _____   sec θ = _____   cot θ = _____

Solve $\triangle$ ABC using the diagram and the given measurements. *Round answers to nearest hundredth.*

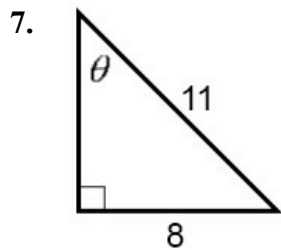**3.** $A = 35$, c = 16

4. $B = 53$, a = 12

A

b

c

C

a

B
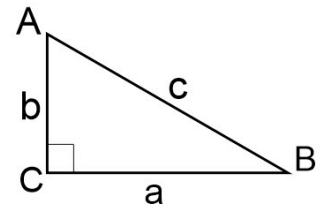
Find the measure of angle θ. *Round answers to nearest tenth.*

5.

5

8

θ

6.

14

6

θ

Evaluate the six trigonometric functions of the angle θ. *Leave answers in fraction form.*

7.

$\sin \theta =$ _____ $\cos \theta =$ _____ $\tan \theta =$ _____

$\csc \theta =$ _____ $\sec \theta =$ _____ $\cot \theta =$ _____

8.

$\sin \theta =$ _____ $\cos \theta =$ _____ $\tan \theta =$ _____

$\csc \theta =$ _____ $\sec \theta =$ _____ $\cot \theta =$ _____
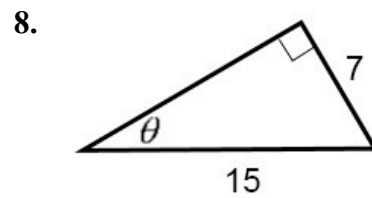
Solve $\triangle$ ABC using the diagram and the given measurements.
Round answers to nearest hundredth.

9. $B = 18$, $c = 24$

10. $A = 67$, $b = 7$
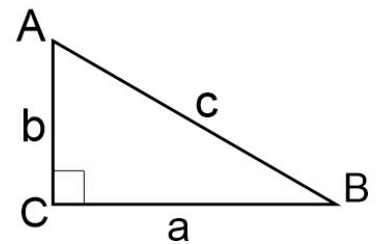
11. A tree casts the shadow shown. What is the height of the tree?
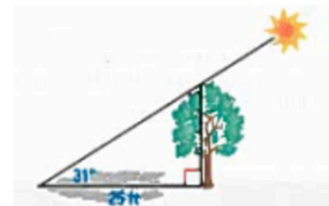
12. Find the length of the prop holding open the piano.

13. The Falls Incline Railway at Niagara Falls has an angle of elevation of 36. The railway extends a horizontal distance of about 138 feet. Find the height and length of the railway.
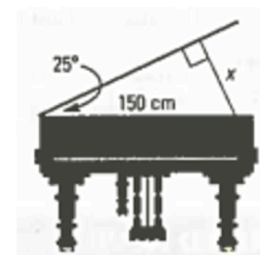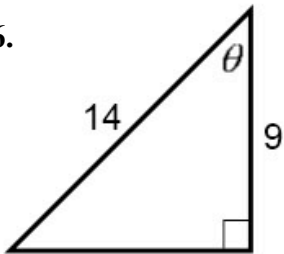
14. A fire truck has a 100 foot ladder whose base is 10 feet above the ground. A firefighter extends a ladder toward a burning building to reach a window 90 feet above the ground. Draw a diagram to represent this situation. At what angle of elevation should the firefighter set the ladder?

15. An airplane is flying at an altitude of 31,000 feet when it begins its descent for landing. If the runway is 104 miles away (how many feet is that?), at what angle of depression does the airplane descend?

PART C:

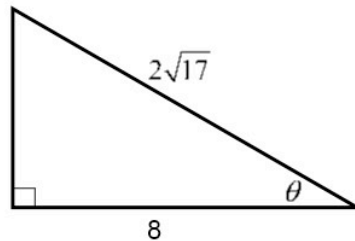**Evaluate the six trigonometric functions of the angle** θ . *Leave answers in fraction form.*

16.

14   9

$\sin\theta =$ ____ $\cos\theta =$ ____ $\tan\theta =$ ____

$\csc\theta =$ ____ $\sec\theta =$ ____ $\cot\theta =$ ____

17.

$2\sqrt{17}$

8

$\sin\theta =$ ____ $\cos\theta =$ ____ $\tan\theta =$ ____

$\csc\theta =$ ____ $\sec\theta =$ ____ $\cot\theta =$ ____

Solve △ ABC using the diagram and the given measurements. *Round answers to nearest hundredth.*

18. $A = 64$, b $= 32$

19. $B = 24$, c $= 10.8$
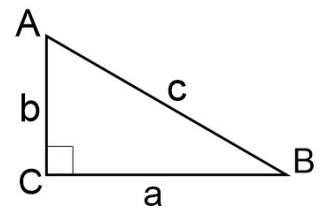
20. You measure the angle of elevation from the ground to the top of a building as 32 . When you move 50 meters closer to the building, the angle of elevation is 53 . How high is the building?

21. You want to photograph a painting with a camera mounted on a tripod. The painting is 3 feet tall, and the bottom of the painting is 1 foot above the camera lens. How far should the camera be positioned from the wall in order to have the largest possible viewing angle θ when you take the photograph? (Hint: Write an equation for θ in terms of x only, and then use a graphing calculator to find the value of x that maximizes θ.

3 ft
1 ft
x

Unit 6.1 Homework Answers

1. $\sin\theta = \dfrac{12}{13}$ $\cos\theta = \dfrac{5}{13}$ $\tan\theta = \dfrac{12}{5}$ $\csc\theta = \dfrac{13}{12}$ $\sec\theta = \dfrac{13}{5}$ $\cot\theta = \dfrac{5}{12}$

2. $\sin\theta = \dfrac{3\sqrt{73}}{73}$ $\cos\theta = \dfrac{8\sqrt{73}}{73}$ $\tan\theta = \dfrac{3}{8}$ $\csc\theta = \dfrac{\sqrt{73}}{3}$ $\sec\theta = \dfrac{\sqrt{73}}{8}$ $\cot\theta = \dfrac{8}{3}$

$B = 55$ $A = 37$

3. $a \approx 9.18$ **4.** $b \approx 15.92$ **5.** $\theta \approx 38.7$ **6.** $\theta \approx 23.2$
$b \approx 13.11$ $c \approx 19.94$

7. $\sin\theta = \dfrac{8}{11}$ $\cos\theta = \dfrac{\sqrt{57}}{11}$ $\tan\theta = \dfrac{8\sqrt{57}}{11}$ $\csc\theta = \dfrac{11}{8}$ $\sec\theta = \dfrac{11\sqrt{57}}{57}$ $\cot\theta = \dfrac{\sqrt{57}}{8}$

8. $\sin\theta = \dfrac{7}{15}$ $\cos\theta = \dfrac{4\sqrt{11}}{15}$ $\tan\theta = \dfrac{7\sqrt{11}}{44}$ $\csc\theta = \dfrac{15}{11}$ $\sec\theta = \dfrac{15\sqrt{11}}{44}$ $\cot\theta = \dfrac{4\sqrt{11}}{7}$

$A = 72$ $B = 23$

9. $a \approx 22.83$ **10.** $a \approx 16.49$ **11.** ≈ 15 feet **12.** ≈ 63.4 cm
$b \approx 7.42$ $c \approx 17.92$

13. height ≈ 100 feet; length ≈ 171 feet **14.** ≈ 53 **15.** ≈ 3.23

16. $\sin\theta = \dfrac{\sqrt{115}}{14}$ $\cos\theta = \dfrac{9}{14}$ $\tan\theta = \dfrac{\sqrt{115}}{9}$ $\csc\theta = \dfrac{14\sqrt{115}}{115}$ $\sec\theta = \dfrac{14}{9}$ $\cot\theta = \dfrac{9\sqrt{115}}{115}$

17. $\sin\theta = \dfrac{\sqrt{17}}{17}$ $\cos\theta = \dfrac{4\sqrt{17}}{17}$ $\tan\theta = \dfrac{1}{4}$ $\csc\theta = \sqrt{17}$ $\sec\theta = \dfrac{\sqrt{17}}{4}$ $\cot\theta = 4$

$B = 26$ $A = 66$

18. $a \approx 65.61$ **19.** $a \approx 9.87$ **20.** ≈ 59 meters **21.** ≈ 37
$b \approx 73.00$ $b \approx 4.39$