1. Find the six trigonometric ratios for θ.   Rationalize and simplify your ratios!!
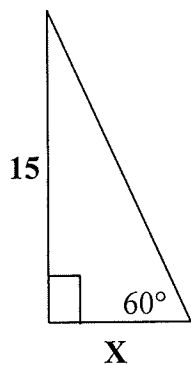

Sin θ = _____ Cos θ = _____ Tan θ = _____

Cot θ = _____ Csc θ = _____ Sec θ = _____

In exercises 2-3, find the exact value of x. Rationalize and simplify.

2._____

2.

3.

3._____

In exercises 4-5, use the exact values of the trigonometric ratios for the special angles to find an acute angle, θ in degrees, that is a solution of the given equation. Hint...draw a triangle.

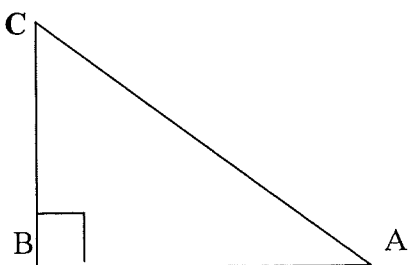**4. $\tan \theta = 1$**   **5. $\cos \theta = \dfrac{\sqrt{3}}{2}$**   **6. $\sin \theta = \dfrac{1}{2}$**

4._____

5._____

6._____

7. Find side a in the figure below if $\text{Csc } A = \dfrac{8}{3}$ and $b = 24$. (Hint: Draw another triangle)

7._____

Find the exact values:

8. $\sin \dfrac{3\pi}{4} =$

8._____

9. $\cos \dfrac{\pi}{2}$

9._____

10. $\tan 5\pi$

10._____

11. $\cos \dfrac{17\pi}{6}$

11._____

12. Find the sine, cosine, and tangent of θ if (-3, 5) is a point on the terminal side of θ.

12. $\sin \theta=$_____

$\cos \theta=$_____

$\tan \theta=$_____

Round all answers to the nearest thousandth. (3 places) Hint: Watch your calculator settings!!!!

1. Find the following :

a. $\sin \dfrac{2\pi}{7}$ b. $\tan 52$ c. $\cos -10°$ d. $\cot 47°$
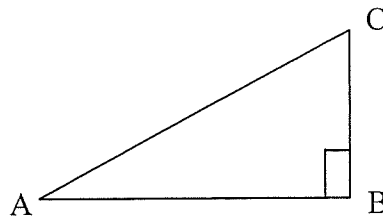
a._____   b._____   c._____   d._____

2. Use the figure to solve the triangle   A ◁_____ B   given A=38° and c=10

(figure: right triangle with vertices A, B, C, right angle at B, C at top)

a=_____   C=_____   b=_____

3. What is $\dfrac{7}{8}$ of a circle in a) degrees and b) radian measure. Simplify your answer.

3a._____

b._____

4. What angle is not co-terminal with -543°?

a. -183°   b. 177°   c. -903°   d. -723°

5 . Find an angle in a) degrees and b) radians that is coterminal to -345 ° between $[0, 2\pi)$

a._____

b._____

6. A 20 ft ladder leans against a building forming a 58° with the ground. The ladder begins to slide down the building, forming a 48° with the ground. Calculate how far the ladder slid down the building and how far was the ladder originally set from the building.

Draw a picture:	Show your work:	Answers:

7. A tower is located 42 m. from a tall tree. From the top of the tower, the angle of elevation to the top of the top of the tree is 26° and the angle of depression to the base of the tree is 35°. How tall the nearest tenth of a meter is the tree?

Draw a picture:	Show your work:	Answers:

8. Two boats are observed from a lighthouse 55 m above the surface of a lake. The angle of depression to the boat closet the lighthouse is 63°, and the angle of depression to the second boat is 35 °. How far apart (to the nearest tenth of a meter) are the boats?
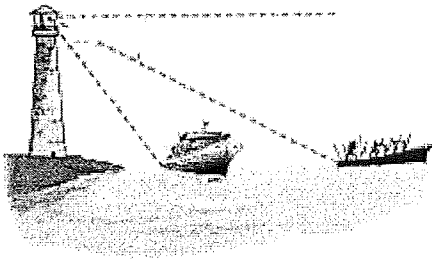
Show your work:	Answers:

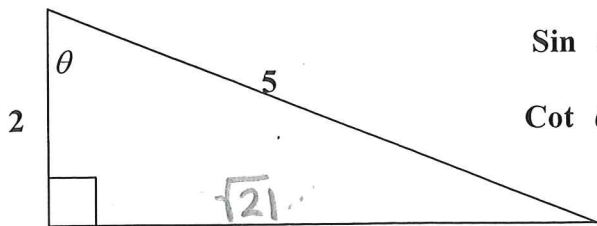9. An airplane travels 250 miles per hour for 3 hours and 15 minutes on a heading of 245°.

a. How far west is the plane from its starting point?
   Round your answer to the nearest **tenth** of a mile.

a._____

b. How far south is the plane from its starting point?
   Round your answer to the nearest **tenth** of a mile.

b._____

PreCalculus Chapter 6
Partner Test   Non Calculator Portion

Name ___Key___

1. Find the six trigonometric ratios for θ. Rationalize and simplify your ratios!!

$\text{Sin } \theta = \dfrac{\sqrt{21}}{5}$ $\text{Cos } \theta = \dfrac{2}{5}$ $\text{Tan } \theta = \dfrac{\sqrt{21}}{2}$ +6

$\text{Cot } \theta = \dfrac{2}{\sqrt{21}} = \dfrac{2\sqrt{21}}{21}$ $\text{Csc } \theta = \dfrac{5}{\sqrt{21}} = \dfrac{5\sqrt{21}}{21}$ $\text{Sec } \theta = \dfrac{5}{2}$

θ
5
2
$\sqrt{21}$

$2^2 + b^2 = 5^2$ $b = \sqrt{21}$
$b^2 = 21$

In exercises 2-3, find the exact value of x. Rationalize and simplify.

2. $\dfrac{15}{\sqrt{3}} = \dfrac{15\sqrt{3}}{3}$ +2

2.
30
15
60°
X
$\dfrac{15}{\sqrt{3}}$

3.
45°   x $10\sqrt{2}$
10
45°
10
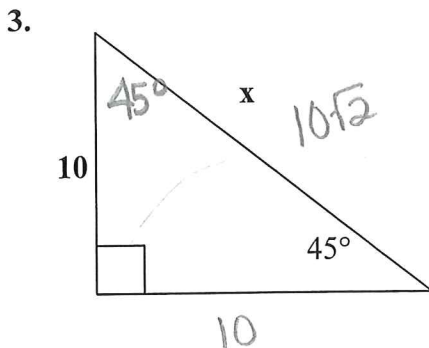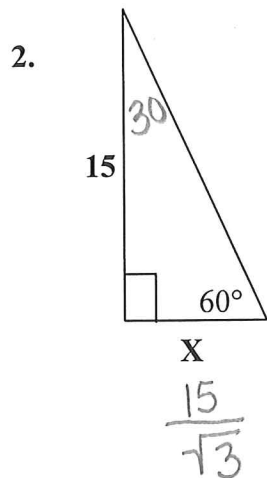
3. $10\sqrt{2}$ +2

In exercises 4-5, use the exact values of the trigonometric ratios for the special angles to find an acute angle, θ in degrees, that is a solution of the given equation. Hint…draw a triangle.
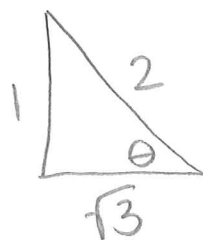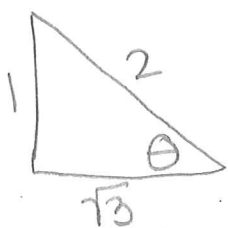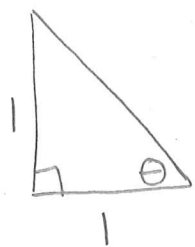
4. $\tan \theta = 1$

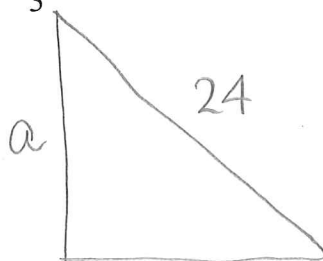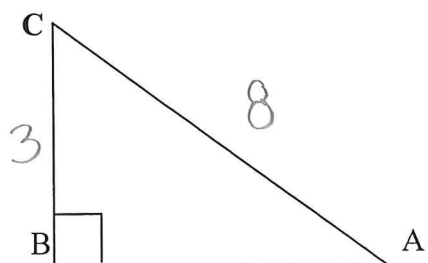**5.** $\cos \theta = \dfrac{\sqrt{3}}{2}$

6. $\sin \theta = \dfrac{1}{2}$

4. $45°$ +1

5. $30°$ +1

6. $30°$ +1

7. Find side a in the figure below if $\text{Csc } A = \dfrac{8}{3}$ and b = 24. (Hint: Draw another triangle)

C
3
8
B
A

24
a

7. 9 +2

$\dfrac{3}{8} = \dfrac{9}{24}$

$8a = 72$
$a = 9$

15

Find the exact values:

8. $\sin\dfrac{3\pi}{4} =$

9. $\cos\dfrac{\pi}{2}$

$\cos = \dfrac{x}{r}$

10. $\tan 5\pi$ $(-1,0)$

5π

$\tan = \dfrac{y}{x}$

11. $\cos\dfrac{17\pi}{6}$

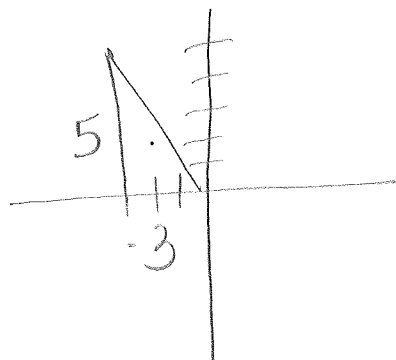$2\dfrac{5}{6}\pi - 2\pi = \dfrac{5\pi}{6}$

3 8. $\dfrac{\sqrt{2}}{2}$

3 9. 0
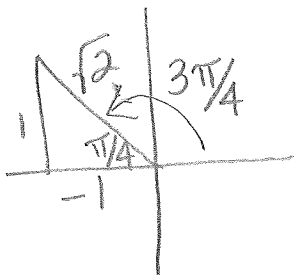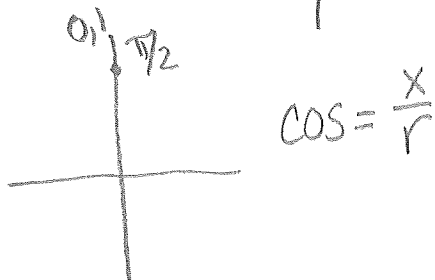
3 10. 0
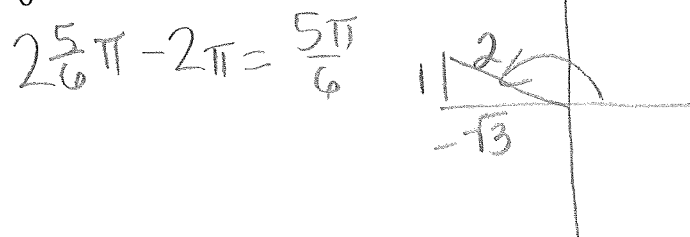
3 11. $\dfrac{-\sqrt{3}}{2}$

12. Find the sine, cosine, and tangent of θ if $(-3, 5)$ is a point on the terminal side of θ.

$(-3)^2 + 5^2 = r^2$

$9 + 25 = r^2$

$\sqrt{34} = r$

2 12. $\sin\theta = \dfrac{5}{\sqrt{34}} = \dfrac{5\sqrt{34}}{34}$

2 $\cos\theta = \dfrac{-3}{\sqrt{34}} = \dfrac{-3\sqrt{34}}{34}$

2 $\tan\theta = \dfrac{-5}{3}$

18

Round all answers to the nearest thousandth. (3 places) Hint: Watch your calculator settings!!!!
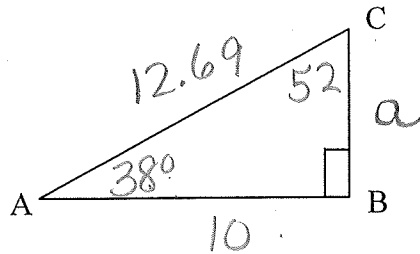
1. Find the following :   *a & b are radians*   *c,d are degree*

a. $\sin \dfrac{2\pi}{7}$ b. $\tan 52$ c. $\cos -10°$ d. $\cot 47°$ $+5$

a._____.782_____   b.__−6.053__   c.___.985___   d.___.932_____

degree mode

2. Use the figure to solve the triangle A ——— B given $A=38°$ and $c=10$

12.69 52 a
38°
10

$\cos 38 = \dfrac{10}{b}$ $+5$

$\sin 38 = \dfrac{a}{12.69}$

a=__7.81__ C=__52°__ b=__12.69____

3. What is $\dfrac{7}{8}$ of a circle in a) degrees and b) radian measure. Simplify your answer. *6.3*

$\dfrac{7}{8} \cdot 360$ $\dfrac{7}{8_4} \cdot 2\pi$ 3a.___315°___ $+1$

b.___7π/4___ $+1$

4. What angle is not co-terminal with -543°? $+360° \quad -360°$

a. -183°   b. 177°   c. -903°   (d.) -723° $+1$

5. Find an angle in a) degrees and b) radians that is coterminal to -345° between $[0, 2\pi)$ $15°$ $+1$

$+360$

$15° \cdot \dfrac{\pi}{180°}$
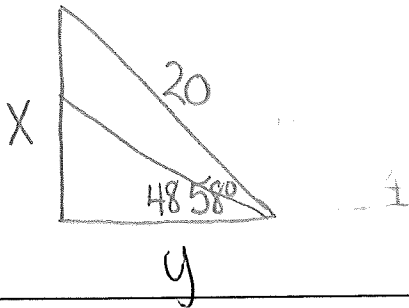
a.___15°___

b.___$\dfrac{\pi}{12}$___ $+1$

⑮

6. A 20 ft ladder leans against a building forming a 58° with the ground. The ladder begins to slide down the building, forming a 48° with the ground. Calculate how far the ladder slid down the building and how far was the ladder originally set from the building.

$$COS\ 58 = \frac{y}{20} \qquad y = 10.6$$

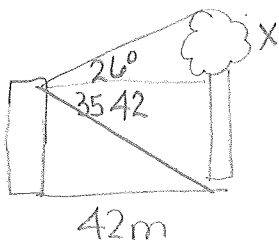| Draw a picture:	Show your work:	Answers:
20 X 48 58° y 1	$Sin\ 58 = \frac{x}{20}$ $\qquad Sin\ 48 = \frac{y}{20}$ $16.96 \qquad\qquad 14.86$ $16.96 - 14.86$	$y = 10.6\ ft$ $x = 2.1\ ft$ 5

7. A tower is located 42 m. from a tall tree. From the top of the tower, the angle of elevation to the top of the top of the tree is 26° and the angle of depression to the base of the tree is 35°. How tall the nearest tenth of a meter is the tree?

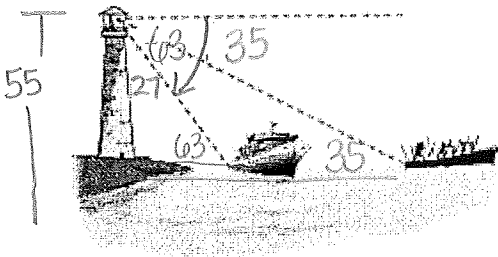| Draw a picture:	Show your work:	Answers:
26° X 35 42 42m	$tan\ 26 = \frac{x}{42}$ $\qquad tan\ 35 = \frac{y}{42}$ $x = 20.5 \qquad y = 29.4$ $20.5 + 29.4 =$	49.9 m 5

8. Two boats are observed from a lighthouse 55 m above the surface of a lake. The angle of depression to the boat closet the lighthouse is 63°, and the angle of depression to the second boat is 35°. How far apart (to the nearest tenth of a meter) are the boats?

55, 63, 35, 27, 63, 35

Show your work:	Answers:
$Tan\ 63 = \frac{55}{x}$ $\qquad Tan\ 35 = \frac{55}{y}$ $x = 28.62 \qquad y = 78.55$	50.53 5

9. An airplane travels 250 miles per hour for 3 hours and 15 minutes on a heading of 245°.

$$COS\ 25 = \frac{w}{812.5}$$

$$d = r \cdot t \qquad (250)(3.25)$$

a. How far west is the plane from its starting point?
Round your answer to the nearest **tenth** of a mile.

W 245° 25 S 812.5

a. 736.4

5

b. How far south is the plane from its starting point?
Round your answer to the nearest **tenth** of a mile.

$$Sin\ 25 = \frac{S}{812.5}$$

b. 343.4

20