

# Pre-Calculus

## 4.1-4.4 – PRACTICE

ASSG # \_\_\_\_\_

Name \_\_\_\_\_ Date \_\_\_\_\_ Per \_\_\_\_\_

- I. Let  $\theta$  be a positive angle in standard position whose terminal side passes through the given point. Draw each angle and find a)  $\sin \theta$ , b)  $\cos \theta$ , and c)  $\theta$ . If  $\theta$  is on the II, III, or IV Q, find d) the reference angle  $\alpha$ . Leave a) and b) in simplest form, and c) and d) rounded to the nearest degree). For 6, find the value of all six trig functions,  $\theta$  and  $\alpha$ .

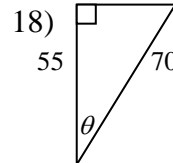
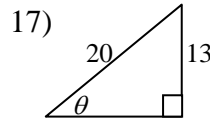
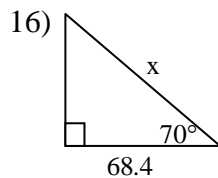
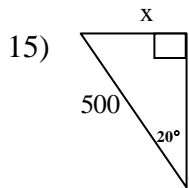
1) (3,4)      2)  $(3, -\sqrt{7})$       3)  $(-\sqrt{5}, 2)$       4)  $(-20, -21)$       5)  $(-4\sqrt{3}, -1)$       6)  $(-\sqrt{2}, \sqrt{2})$

- II. Let  $\theta$  or  $t$  be a positive angle in standard position whose terminal side passes through the given point. Find  $\theta$  or  $t$  without using a calculator.

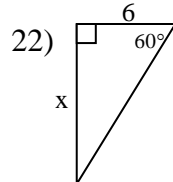
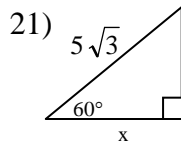
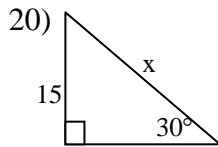
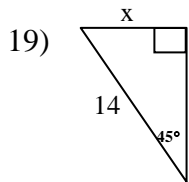
7) (5,5)      8)  $(4, 4\sqrt{3})$       9)  $(2\sqrt{3}, 2\sqrt{3})$       10)  $(2\sqrt{3}, -2)$       (7-10 find  $\theta$  (degrees))

11)  $(-\frac{\sqrt{3}}{2}, \frac{1}{2})$       12)  $(\sqrt{2}, -\sqrt{6})$       13)  $(-1, -\frac{1}{\sqrt{3}})$       14)  $(|a|, \frac{|a|}{\sqrt{3}})$  (11-14 find  $t$  (radians))

- III. Find “x” or “ $\theta$ ” in each triangle. (“x” to the nearest tenth and  $\theta$  to the nearest degree).



- IV. Find the exact value of “x” in each triangle. Leave your answers in simplest radical form.



- V. Find a value of  $\theta$  that satisfies the given equation. Round your answer to the nearest hundredth.

23)  $\sin \theta = 0.6626$       24)  $\cos \theta = .9964$       25)  $\cot \theta = \frac{1}{4}$       26)  $\csc \theta = \frac{2}{3}$

### VI. Degrees/Radians

27) Change  $\frac{5\pi}{6}$  radians to degree measure.28) Change  $70^\circ$  to radian measure in terms of  $\pi$ .29) For a circle of radius 7 feet, find the arc length  $s$  subtended by a central angle of  $18^\circ$ .  
Leave the answer in terms of  $\pi$ .

**VII. Find the value of each of the following expressions. Leave answers in simplest form. No decimal answers.**

30)  $\sin \frac{3\pi}{2} - \sec (15\pi)$

31)  $\cos \frac{5\pi}{4} + \tan \frac{5\pi}{3}$

32)  $\cot \frac{5\pi}{2} + \sin (-20\pi)$

33)  $\sin \frac{3\pi}{4} - \cos \frac{\pi}{3}$

34)  $\csc \frac{5\pi}{6} + \tan \left( -\frac{5\pi}{3} \right)$

35) a)  $\csc 90^\circ$     b)  $\sec 180^\circ$     c)  $\cot 270^\circ$     d)  $\sin \frac{\pi}{3}$     e)  $\cos -\frac{5\pi}{3}$     f)  $\tan \left( -\frac{11\pi}{6} \right)$

**VIII. Coterminal Angles/Definitions:**

36) Find the least negative angle coterminal with  $\frac{5\pi}{12}$

37) Find the least positive angle coterminal with  $\frac{23\pi}{5}$

38) Find a) the least negative and b) the least positive angle measurement coterminal with  $240^\circ$ .

39) Define: a) Angle, b) Reference Angle, c) Coterminal Angle, d) Quadrantal Angle, and e) Angle in Standard Position

**IX. Identities:**

40) List the Pythagorean Identities

41) List the Reciprocal Identities

42) List the Quotient Identities

**X. Co-Functions:**

**Fill in the blanks with the corresponding co-function:**

43)  $\sin 30^\circ = \underline{\hspace{2cm}}$     44)  $\cot \frac{\pi}{2} = \underline{\hspace{2cm}}$     45)  $\sec \frac{\pi}{4} = \underline{\hspace{2cm}}$     46)  $\cos 45^\circ = \underline{\hspace{2cm}}$

**XI: Applications:**

47) Juliet on her balcony, 25 feet off the ground, spots Romeo approaching on ground level. She uses her angle measuring device and finds his position to be  $3^\circ$  from the horizontal (angle of depression =  $3^\circ$ ). **To the nearest tenth,** how far away is Romeo from Juliet (on her balcony)?

DRAWING	WORK: INCLUDE SET UP AND WORK

- 48) The angle of elevation from a sailboat to the top of a lighthouse on the shore measures  $25^\circ$ . The sailboat is 322 ft away from the base of the lighthouse.

**To the nearest foot**, find the height of the lighthouse.

DRAWING	WORK: INCLUDE SET UP AND WORK

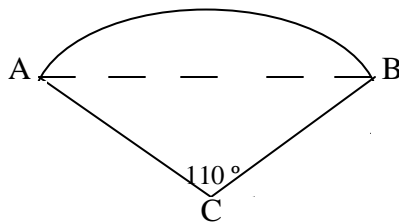
- 49) Each leg of an isosceles triangle is 260 cm. long and each base angle measures  $35^\circ$ .

**To the nearest hundredth**, find the length of the base.

DRAWING	WORK: INCLUDE SET UP AND WORK

- 50) A windshield wiper arm 30.5 cm. long pivots at point C and sweeps out an angle of  $110^\circ$ .

**To the nearest whole** number, find AB.



- 51) A Pendulum is 35.7 cm. long, and the bob at the end of the pendulum travels 25.5 cm. **To the nearest degree** find the measure of the angle through which the pendulum swings.

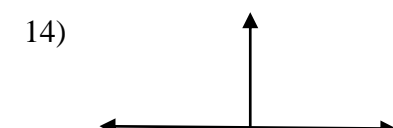
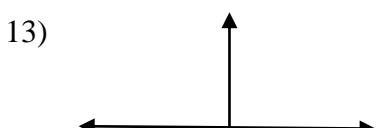
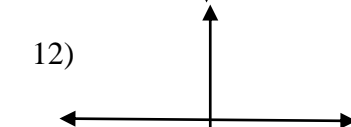
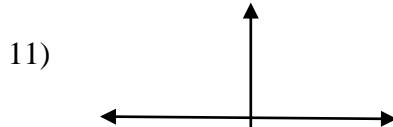
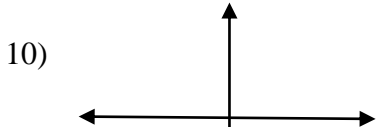
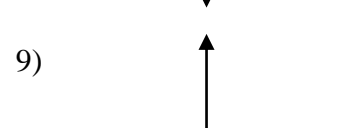
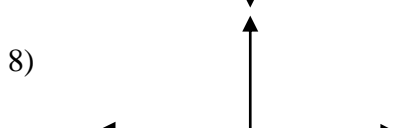
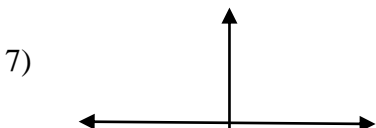
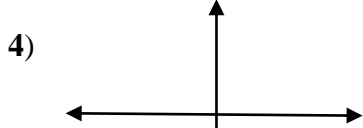
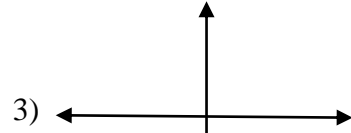
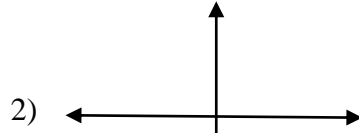
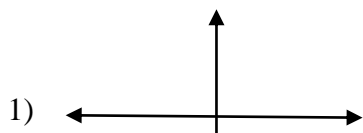
DRAWING	WORK: INCLUDE SET UP AND WORK

- 52) Byron rides his bike 6.3 km. If the radius on the tires of his bike is 30 cm., determine the number of radians that a spot on of the tires will travel during the trip.

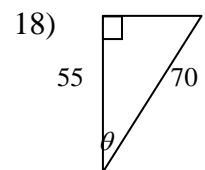
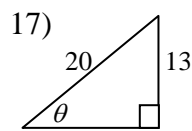
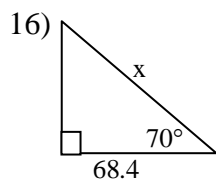
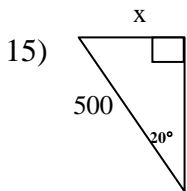
## ANSWERS TO PRACTICE WORKSHEET 4.1-4.4

1) a) $\sin \theta =$	13)	38) a)
b) $\cos \theta =$	14)	b)
c) $\theta \approx$	15)	39)a)
d) $\alpha \approx$	16)	b)
2) a) $\sin \theta =$	17)	c)
b) $\cos \theta =$	18)	d)
c) $\theta \approx$	19)	e)
d) $\alpha \approx$	20)	40) a)
3) a) $\sin \theta =$	21)	b)
b) $\cos \theta =$	22)	c)
c) $\theta \approx$	23)	41) a)
d) $\alpha \approx$	24)	b)
4) a) $\sin \theta =$	25)	c)
b) $\cos \theta =$	26)	d)
c) $\theta \approx$	27)	e)
d) $\alpha \approx$	28)	f)
5) a) $\sin \theta =$	29)	42) a)
b) $\cos \theta =$	30)	b)
c) $\theta \approx$	31)	43)
d) $\alpha \approx$	32)	44)
6) $\sin \theta =$ $\sec \theta =$	33)	45)
$\cos \theta =$ $\csc \theta =$	34)	46)
$\tan \theta =$ $\theta \approx$	35) a)	47)
$\cot \theta =$ $\alpha \approx$	b)	48)
7)	c)	49)
8)	d)	50)
9)	e)	51)
10)	f)	52)
11)	36)	
12)	37)	

**WORK/DRAWINGS for problems 1-22**



**II. Find “x” or “ $\theta$ ” in each triangle. (“x” to the nearest tenth and  $\theta$  to the nearest degree).**



**Find the exact value of “x” in each triangle. Leave your answers in simplest radical form.**

