

Math 111 - Trigonometry

Practice Exam 1

Warning: This study guide is not all inclusive- there may be material on the test which is covered in the book but not here. This is simply meant to serve as a supplement to the problems in the book.

1. Find the angle of smallest positive measure co-terminal with each angle.

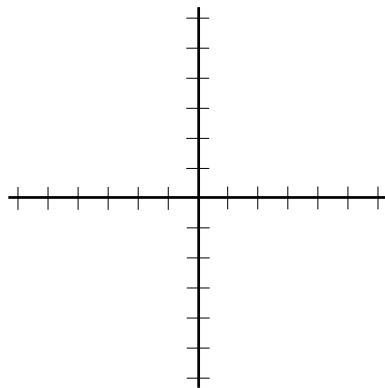
(a) $\theta = -442^\circ$

(b) $\theta = 1826^\circ$

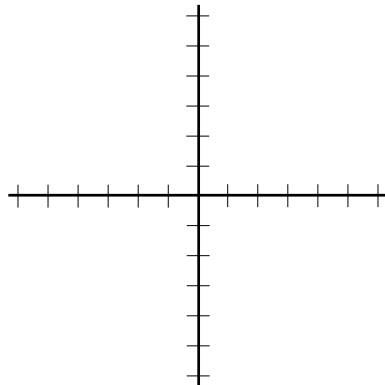
(c) $\theta = 688^\circ$

2. Sketch each angle in standard position, and give the quadrant of each angle.

(a) $\theta = -442^\circ$



(b) $\theta = 688^\circ$



3. What are the defining characteristics of an isosceles, obtuse triangle?

4. David, A lifeguard located 20 yards from the water spots Scuba Steve in distress. Scuba Steve is 30 yards from the shore and 100 yards East of David. Suppose David runs, then swims to Scuba Steve in a direct line. Sketch the situation, and determine how far east from his original position David will enter the water.

5. Decide whether the following statements are *possible* or *impossible*.

(a) $\sin \theta = \sqrt{2}$

(b) $\sec \phi = \frac{3}{5}$

(c) $\tan \alpha = 4,558$

6. If $\sin(20^\circ) = a$ and $\sin(70^\circ) = b$, calculate in terms of a and b the following:

(a) $\cot(70^\circ)$

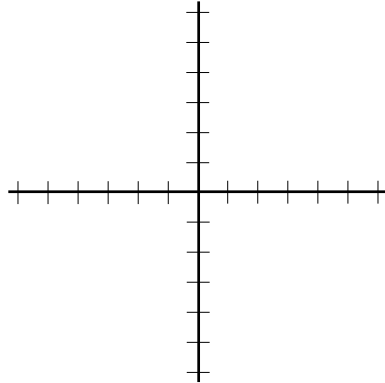
(b) $\sec(70^\circ)$

(c) $\csc(20^\circ)$

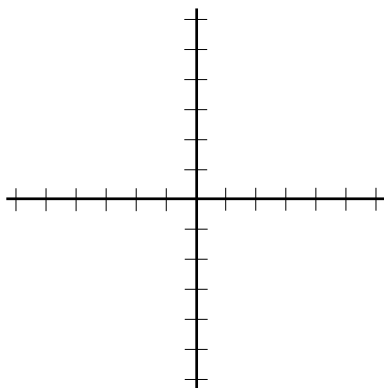
(d) $\tan(20^\circ)$

7. Calculate the following (hint: sketch to get an idea of which quadrant the angles lie in):

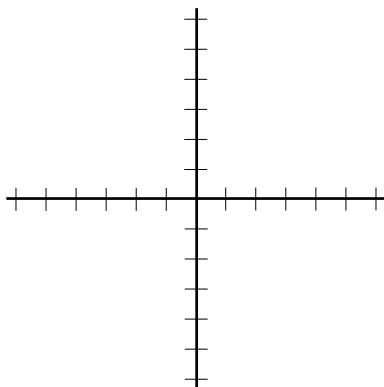
(a) $\cot(135^\circ)$



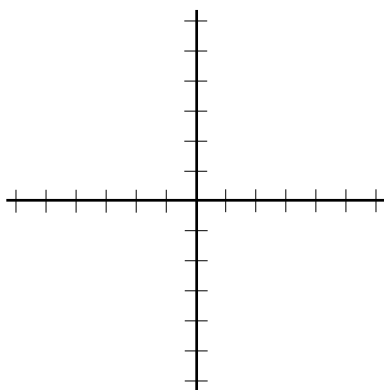
(b) $\sin(210^\circ)$



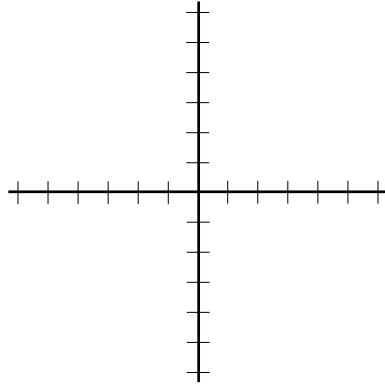
(c) $\csc(1110^\circ)$



(d) $\tan(-675^\circ)$



(e) $\cos(-330^\circ)$



8. Simplify the following expression:

$$\cos(120^\circ) + 2\sin^2(60^\circ) - \tan^2(30^\circ)$$

9. An 8 foot tall fire truck is parked 10 feet next to a 45 foot tall building. There is a man on the top of the building who is stranded, and the firefighters need to extend their 40 foot long ladder, located on top of the firetruck, to the roof to save the man. Is the ladder long enough to reach him? Why or why not?

10. Convert the following from radians to degrees:

(a) $\pi/2$

(b) 430

(c) $5\pi/7$

(d) 2

(e) $3\pi/4$

(f) 12π

(g) 1000

11. Convert the following from degrees to radians:

(a) 225°

(b) 430°

(c) 737°

(d) $2\pi^\circ$

(e) $3\pi/4^\circ$

(f) 720°

(g) -1000°

(h) -547°

12. Evaluate the following:

(a) $\tan(2\pi/3)$

(b) $\sin(3\pi/2)$

(c) $\cos(-4\pi/3)$

13. Given the following information, calculate the length of the arc from the horizontal axis to the end point of the terminal side of the ray:

(a) $\theta = \pi/4$ on a circle of radius 3

(b) $\theta = 3/2$ radians on the unit circle

14. Using the information from part 5, calculate the area of the sector of the circle:

(a) $\theta = \pi/4$ on a circle of radius 3

(b) $\theta = 3/2$ radians on the unit circle

15. Which of the following angles in radians are obtuse?

(a) 1

(b) 2

(c) 3

(d) 4

16. The ray determined by $2x + 3y = 0$, with $x \leq 0$, is the terminal ray of an angle θ in standard position. Find the exact value of $\sin \theta$.

17. A, B are angles in standard position which have the same reference angle. Does $\sin A = \sin B$?