

This test is in two parts. On part one, you may not use a calculator; on part two, a calculator is necessary. When you complete part one, tear it off and place it at the front of your desk, I will collect it. Once you have turned in part one, you may not go back to it.

PART ONE - NO CALCULATORS ALLOWED

- (1) Find each of the following: (Note: here, answers to inverse trig. problems should be in radians, not degrees) (2 points each)

(a) $\cos^{-1}\left(\frac{-\sqrt{2}}{2}\right) = \underline{\hspace{2cm}}$

(b) $\cos^{-1}(0) = \underline{\hspace{2cm}}$

(c) $\tan^{-1}\left(\frac{\sqrt{3}}{3}\right) = \underline{\hspace{2cm}}$

(d) $\cos(315^\circ) = \underline{\hspace{2cm}}$

(e) $\sin(120^\circ) = \underline{\hspace{2cm}}$

(f) $\sin^{-1}(2) = \underline{\hspace{2cm}}$

(g) $\cos(0) = \underline{\hspace{2cm}}$

(h) $\sin^{-1}(-1) = \underline{\hspace{2cm}}$

(i) $\cot\left(\frac{7\pi}{4}\right) = \underline{\hspace{2cm}}$

(j) $\sin^{-1}\left(-\frac{1}{2}\right) = \underline{\hspace{2cm}}$

(k) $\sin^{-1}\left(\sin\left(\frac{5\pi}{3}\right)\right) = \underline{\hspace{2cm}}$

(l) $\tan(135^\circ) = \underline{\hspace{2cm}}$

- (2) HOW MANY solutions does each of the following equations with the given restrictions on θ have? (Do not need to solve, just tell how many solutions there would be.)

(1 point each)

(a) $\sin\theta = \frac{1}{5}; 0 \leq \theta < 2\pi$ _____ (c) $\tan\theta = -7; 0 \leq \theta \leq \pi$ _____

(b) $\theta = \sin^{-1}(0.3)$ _____ (d) $\cos\theta = \frac{2}{7}$ _____

(3) Solve the following equations exactly. (all solutions) (3 points each)

(a) $\cos^2 \theta - 1 = 0$

(b) $\sin\left(\frac{x}{3}\right) = \frac{\sqrt{2}}{2}$

(4) Solve the following equations exactly for . _____ (3 points each)

(a) $\tan(2x) = \sqrt{3}$

(b) $4\cos\theta - 2 = 0$

(5) Solve the following equations exactly for $0 \leq \theta \leq 2\pi$. (3 points each)

(a) $\cos\theta = \frac{1}{4}$

(b) $\sin\theta = -0.3$

(c) $\tan\theta = 5$

NAME: _____

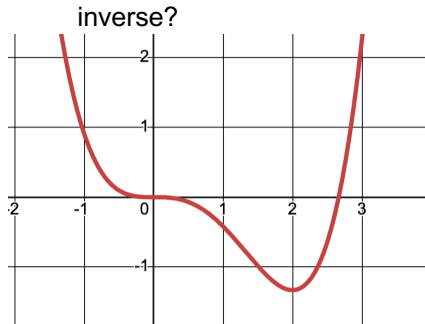
MATH 8 Sample Test 3

PART TWO - CALCULATORS ALLOWED (no graphing calc.)

Show your work on this paper. EXACT answers are expected unless otherwise specified.

Fill in the blanks with the most appropriate, simplified answer.

(6) The graph of a function is given. What restriction would you make so that the restricted function has an



(2 points)

(7) Given that $\tan(\theta) = -\frac{2}{3}$ and θ is in Quadrant II, find the values of the other 5 trig functions of θ exactly (show work)

(10 points)

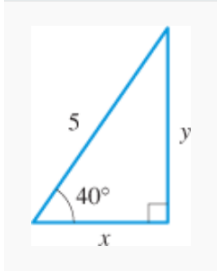
$\sin(\theta) =$ _____ $\cos(\theta) =$ _____ $\sec(\theta) =$ _____

$\csc(\theta) =$ _____ $\cot(\theta) =$ _____

(8) Evaluate exactly: $\cos\left(\sin^{-1}\left(\frac{1}{5}\right)\right)$ (You must show work, calculator may not be used). (3 points)

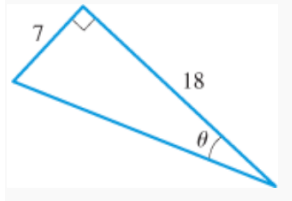
(9) Solve for x and y , exactly

(4 points)

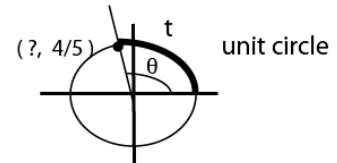
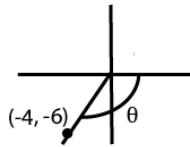
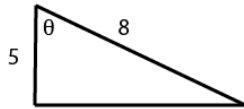


(10). Solve for θ exactly:

(2 points)



(11) This problem checks your understanding one three versions of the definitions of the trigonometric functions. Given the following figures, find: (2 points each)



(a) $\tan \theta =$ _____

(c) $\cos \theta =$ _____

(e) $\tan t =$ _____

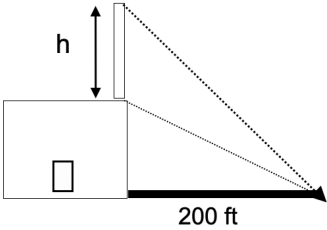
(b) _____ degrees

(d) _____ degrees

(f) _____
(t is a number, not angle)

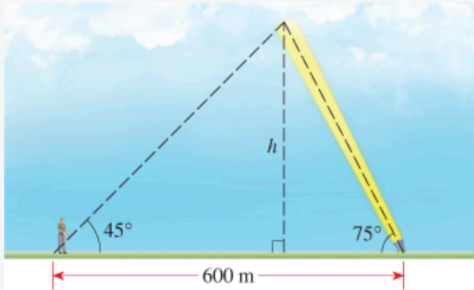
(12) An person sitting at the top of a 300 foot cliff at the edge of the ocean observes a ship directly offshore. The angle of depression from the person to the ship is 23 degrees. How far is the ship from shore (exact and approximate) (4 points)

- (13) At a point on the ground 200 feet from the base of a building, the angle of elevation to the bottom of a smokestack on the top of the building is 35° , and the angle of elevation to the top of the smokestack is 53° . Find the height, h , of the smokestack exactly. (7 points)



- (14)

Height of Cloud Cover To measure the height of the cloud cover at an airport, a worker shines a spotlight upward at an angle 75° from the horizontal. An observer 600 m away measures the angle of elevation to the spot of light to be 45° . Find the height h of the cloud cover.



(7 points)