

Directions: Show a complete solution to each problem in the space provided. You may use a calculator and your book on this exam. You have 2 hours to complete this test.

- (1) Define the complement and supplement of an angle. Find the complement and supplement of the angle 18° .

- (2) Angles are generally measured in either degrees or radians. Explain the difference between 2° and 2 radians. Which is larger?

- (3) Use the Unit Circle to find the following values:

(a) $\cos \frac{\pi}{4} =$

(b) $\csc 60^\circ =$

(c) $\sin \frac{4\pi}{3} =$

(d) $\tan \frac{\pi}{2} =$

(e) $\sec 30^\circ =$

(4) Use your calculator to find the following values: (Hint: Make sure you are set in the proper mode for each problem – degrees or radians!)

(a) $\sin 10^\circ =$

(b) $\tan 2.3 =$

(c) $\cos 1.5 =$

(d) $\cot 50^\circ =$

(e) $\sec 27^\circ =$

(5) Find the value of x for the diagram shown on page 161, number 64 of the textbook.

(6) Sketch a right triangle corresponding to $\theta = \frac{3}{4}$, where θ is an acute angle, and find the value of the other five trigonometric functions for θ .

(7) Use the Circular Functions to find the exact value of the six trigonometric functions for the angle θ which passes through the point (7, -9).

(8) Determine the quadrant where the angle θ lies if $\cos\theta < 0$ and $\sin\theta > 0$.

(9) Use the Unit Circle to find two values of θ (in degrees) which satisfy $\theta = \frac{1}{2}$.

(10) Use your calculator to find 2 different angles between 0° and 360° that satisfy $\theta = 0.4565$.

(11) List one basic identity that we have studied in this course and justify why it is true.

(12) Suppose that θ is an angle lying in quadrant IV with $\theta = \frac{3}{5}$. Use the identity $\cos^2\theta + \sin^2\theta = 1$ to find the value of $\sin\theta$.

(13) Suppose that a 40 foot ladder leans against the side of a building. Find the distance h , up the side of the building if the angle of elevation of the ladder is 52° .

(14) Suppose that a surveyor wishes to find the distance across a river. Use the information in the diagram on page 162, problem #70 to find the distance w .

(15) Suppose that you are standing due west of the Eiffel Tower at an unknown distance and, at that position, the angle of elevation to the top of the tower is 54° . Next you walk 100 meters due west of your first position and calculate the new angle of elevation to be 44° . Use this information to determine the height of the Eiffel Tower. You must show all of your work to receive full credit.