

Show all necessary work. Full credit is based on work shown!

12pts

1. Conversions:

a. Express 150° in radian measure.

b. Express $\frac{5\pi}{4}$ radians in degrees.

c. Convert $64^\circ 45' 15''$ to decimal form.

d. Convert 53.82° to degrees, minutes, and seconds.

10pts

2. Give the **exact value** for each of the following trig functions (without using a calculator).

Draw and label the sides of an appropriate right triangle.

a. $\sec 60^\circ =$

b. $\csc 45^\circ =$

12 pts

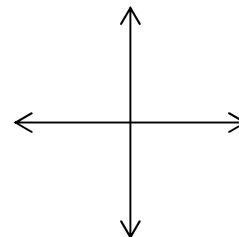
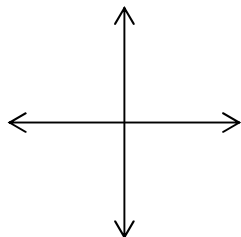
3. Give **exact value** for each **trig function**, without using a calculator. Draw and label a sketch to illustrate each one. (Your sketch should illustrate the angle and its reference angle.)

a. $\tan 210^\circ =$ _____

reference $\angle =$ _____

b. $\sec\left(\frac{5\pi}{6}\right) =$ _____

reference $\angle =$ _____



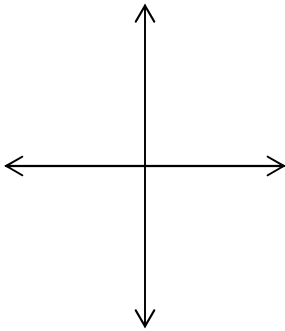
5pts

4. The cosine function is negative in what quadrants? _____ Explain:

12pts

5. a. If $\tan \theta = -\frac{4}{1}$ and $\sin \theta < 0$, angle θ is in what quadrant? _____

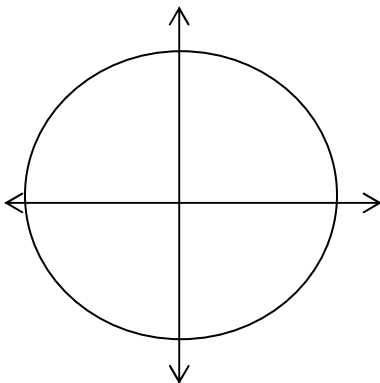
b. Draw a sketch to illustrate angle θ and its reference angle (and triangle), then find the **exact value of the remaining five trigonometric functions of θ** . (Do not use a calculator.)



12pts

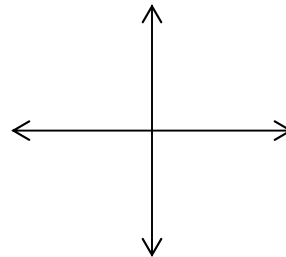
6. Sketch each angle and label the coordinates for each appropriate point on this unit circle.

- a. 270° b. 240° c. $\left(\frac{5\pi}{6}\right)$ radians



9pts

7. Sketch the angle and then find the exact value for each :



a. $\cos\left(\frac{11\pi}{3}\right) =$ _____

b. $\tan\left(\frac{11\pi}{3}\right) =$ _____

4pts

8. Find the exact value of this expression using the Fundamental Identities and/or the Complementary Angle Theorem. Show your steps to indicate which identities you used. Do NOT use a calculator.

$$\tan 35^\circ \cdot \sec 55^\circ \cdot \cos 35^\circ =$$

9pts

9. **Use a calculator** to find the approximate value of each expression. Show how you are calculating each of these and **round each answer to four decimal places.**

a. $\cos 14^\circ =$ b. $\sin\left(\frac{3\pi}{10}\right) =$ c. $\cot\left(\frac{11\pi}{12}\right) =$

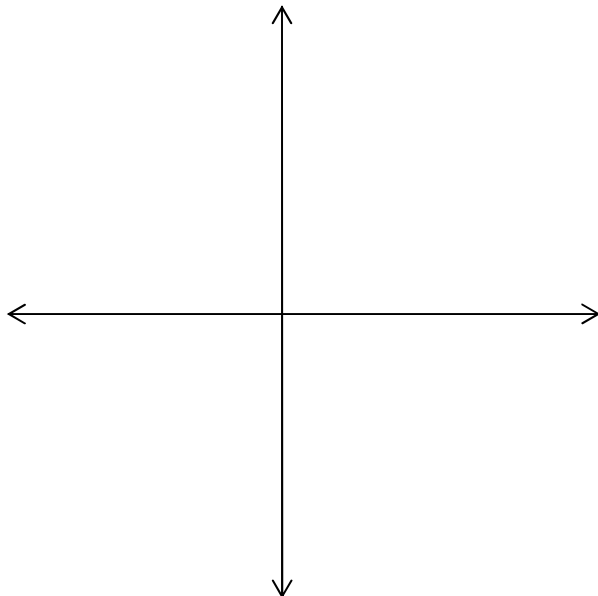
15pts

10. $f(x) = 2x^3 + 11x^2 - 7x - 6$

a. What is the maximum number of zeros of $f(x)$? _____

b. List all possible rational zeros for $f(x)$: _____

c. Sketch a graph of $f(x)$



d. What are the real zeros of $f(x)$?

e. Write $f(x)$ in completely factored form.