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Sixteenth Set of Homework

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Due: Monday March 28

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Please note: You should fully justify your answers.

Trigonometric ratios and Cartesian coordinates

1. The point P is on the terminal side of an angle θ in standard position with $0° \leq \theta < 360°$. Draw θ, determine the values of $\sin\theta$, $\cos\theta$, $\tan\theta$, and $\cot\theta$. You should give *exact* answers.

   A. $P(-3, -2)$ B. $P(4, 3)$ C. $P(-\sqrt{3}, \sqrt{2})$ D. $P(2, -5)$ E. $P\left(\dfrac{3}{2}, -\dfrac{3\sqrt{3}}{2}\right)$

2. Find the measure in degrees of θ for each of the of the points in the previous question.

3. Find the possible refernce angles for a point P that lies in the line with equation:

   A. $y = x$ B. $y = -3x$ C. $y = x\sqrt{3}$ D. $2x + 3y = 0$ E. $3x - 5y = 0$

4. **Extra Credit:** Find the possible refernce angles for a point P that lies in the line with equation $2x - 4y = 5$.

5. A point P is at distance r from the origin and its reference angle is θ. Find the coordinates of P if:

   (a) $r = 3\sqrt{2}$, $\theta = 90°$

   (b) $r = 5$, $\theta = 300°$.

   (c) $r = \sqrt{7}$, $\theta = 180°$.

   (d) $r = 3.1$ and $\theta = 203°$.

   (e) $r = 4.32$ and $\theta = 98°$.

   (f) $r = 4$, $\tan\theta = 5$, and P lies in the first quadrant.

   (g) $r = 1$, $\sin\theta = -\dfrac{\sqrt{2}}{2}$, and P lies in the third quadrant.

   (h) $r = 4$, $\sin\theta = \dfrac{3}{5}$, and $\cos\theta < 0$.

   (i) $r = 8$, $\cos\theta = \dfrac{2}{3}$ and P lies in the fourth quadrant.

6. A point is at distance 5 from the origin. The tangent of its reference angle is 2. Find the coordinates of the point.

7. A point P in the second quadrant is at distance $2\sqrt{2}$ from the origin. The tangent of its reference angle is -3. Find the point P.

8. A point P lies in the line with equation $2x - 3y = 7$. The tangent of its reference angle is 5. Find the point P.