Trigonometry and the unit circle Worksheet

Precalculus

Name _____ Date _____

Warm-up

1. Convert to degrees: $\frac{\pi}{6}$

2. Which quadrant has negative sine and positive cosine?
   (A) II (B) I (C) IV (D) III

3. $\sin^2 12° + \cos^2 12°$

4. $\cos 0°$

5. $\sin\theta = \frac{3}{10}$ and $\cos\theta = \frac{4}{10}$. Find $\tan\theta$.

Practice

6. Find the arc length: radius 16, angle $\frac{\pi}{4}$. Use pi.

7. $\sin\frac{7\pi}{6}$

8. $\cos\theta = \frac{8}{17}$ in Quadrant I. Find $\sin\theta$.

9. Convert to degrees: $\frac{9\pi}{6}$

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10. $\cos 120°$

11. $\sin(-\theta)$ when $\sin\theta = \dfrac{6}{10}$. Write it as a decimal.

12. Convert to radians: $150°$

13. $\tan 225°$

Challenge

14. How many full turns is 10π radians?

15. $\cos \dfrac{11\pi}{6}$

16. For how many values in $[0, 2\pi)$ is $\sin\theta = \dfrac{1}{2}$?
    (A) Two (B) None (C) Four (D) One

17. Find an equivalent angle between $0°$ and $360°$ for $588°$.

18. $\sin\theta = \dfrac{3}{5}$, with θ in Quadrant II. Find $\cos\theta$.

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Trigonometry and the unit circle Worksheet: Answer Key

Precalculus

1. 30

   $180 \div 6$.

2. (C) IV

   y negative, x positive.

3. 1

   It's 1 for every angle.

4. 1

   At $0°$ the point is $(1, 0)$.

5. $\frac{3}{4}$

   Divide sine by cosine.

6. 4π

   $r\theta$.

7. $-\frac{1}{2}$

   $210°$, reference $30°$, Quadrant III.

8. $\frac{15}{17}$

   $17^2 - 8^2 = 225$.

9. 270

   $\frac{9 \times 180}{6}$.

10. $-\frac{1}{2}$

    Reference $60°$, Quadrant II.

11. -0.6

    Sine is odd.

12. $\frac{5\pi}{6}$

    Multiply by $\frac{\pi}{180}$.

13. 1

    Reference $45°$, Quadrant III.

14. 5

    Each turn is 2π.

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15. $\dfrac{\sqrt{3}}{2}$

    330°, reference 30°, Quadrant IV.

16. (A) Two

    30° and 150°.

17. 228

    Subtract 360°.

18. $-\dfrac{4}{5}$

    $\sin^2 + \cos^2 = 1$, and cosine is negative in II.

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