Name:_____ Date:_____

HW Pre Calculus 12 Section 4.3 Trigonometric Ratios

1. What are reference angles? Why are they used?

2. Can a reference angle be negative? Or does it have to be positive? Explain:

3. Suppose $0 < \theta < 2\pi$ and has a reference angle of $\frac{\pi}{7}$, what are the possible values of θ ?

4. What are special triangles? How are they used for finding the sine, cosine, or tangent of angles larger than 90 degrees?

5. What are the definitions of $\csc\theta$, $\sec\theta$, and $\cot\theta$? What are the domain and range of these trigonometric ratios?

6. Given that $\sin\theta = \frac{a}{b}$, then what are the ratios of $\csc\theta$ and $\sec\theta$ equal to in terms of "a" and "b"?

7. Can $\csc\theta = 0.25$? Explain:

8. Find the reference angles for each of the following angles in standard position:

a) $\theta = \frac{11\pi}{3}$	b) $\theta = \frac{13\pi}{5}$	c) $\theta = \frac{17\pi}{4}$
d) $\theta = \frac{23\pi}{6}$	e) $\theta = \frac{-17\pi}{3}$	f) $\theta = \frac{-33\pi}{5}$.
g) $\theta = \frac{37\pi}{6}$	h) $\theta = 84.25^R$	i) $\theta = 15.52^R$

9. Use special triangles to find the ratios of the following. Do not use a calculator:

a) $\sin\frac{2\pi}{3}$	b) $\cos\frac{\pi}{4}$	c) $\tan\frac{\pi}{6}$
d) $\sin\frac{7\pi}{6}$.	e) $\cos\frac{8\pi}{3}$	f) $\tan\frac{5\pi}{6}$
g) $4\times\cos\left(-\frac{5\pi}{3}\right)$	h) $2\times\sin\left(\frac{-3\pi}{4}\right)$	i) $\sin^2\frac{8\pi}{3}$

10. Find the value of the following ratios without using a calculator

a) $\sin\frac{9\pi}{4}$	b) $\cos\frac{11\pi}{3}$	c) $\tan\frac{13\pi}{6}$
d) $\sin\frac{53\pi}{3}$	e) $\cos\frac{55\pi}{6}$	f) $\tan\frac{17\pi}{3}$
g) $\cos\frac{20\pi}{6}$	h) $\sin\frac{-19\pi}{4}$	i) $\tan\frac{-23\pi}{6}$

11. Suppose $\sin\theta = -\frac{5}{8}$, then what are the exact values of the other six trigonometric ratios? Show all your work and steps:

12. Suppose $\cos\theta = -\frac{\sqrt{6}}{5}$, then what are the exact values of the other six trigonometric ratios? Show all your work and steps:

13. Suppose $\sec\theta = -\frac{7}{2\sqrt{3}}$, then what are the exact values of the other six trigonometric ratios? Show all your work and steps:

14. Suppose $\cot^2\theta = \frac{13}{17}$, then what are the exact values of the other six trigonometric ratios? Show all your work and steps:

15. Suppose $2\sin^2\theta + 1 = \frac{14}{5}$, then what are the exact values of the other six trigonometric ratios? Show all your work and steps:

16. Suppose θ_1 and θ_2 are two different angles between 0 and 2π with the same reference angles. Do $\sin\theta_1$ and $\sin\theta_2$ have to be equal? YES or NO? Explain: