Math 1316 – Trigonometry ***Exam* 2** ***Review***

Instructor: Fred Khoury

1. Convert to exact radians.

a) 215° *b*) 390° *c*) 144° *d*) 249.8°

2. Convert to exact degrees

a) $\frac{17\pi}{12}$ *b)* $\frac{7\pi}{8}$ *c)* $\frac{9\pi}{4}$

3. Find the exact circular function value

a) $\sec\left(-\frac{3\pi}{4}\right)$ *b)* $\cot\left(-\frac{11\pi}{6}\right)$ *c)* $\csc(0.2449)$

4. A wheel of radius 5 inches rotates at the rate of 20 revolutions per minute.

a) Find the angular velocity of a point on the surface of the wheel in radians per minute.
b) Find the linear velocity of a point on the surface of the wheel in inches per minute.
c) How far does a point on the surface of the wheel travel in 30 *seconds*?

5. A particle is moving along a circle of radius 4 inches. It completes 15 revolutions every minute. For each of the following, round your answer to the nearest tenth of a unit.

a) Find the angular velocity of the particle in radians per minute.
b) Find the linear velocity of the particle in inches per minute.

6. The sector formed by a central angle of 50° has an area of 10π sq ft. Find the radius of the circle.

7. A circle of radius 8 cm has a central angle θ measuring 56°.

a) Find the length of the arc of the circle determined by θ.
b) Find the area of the sector of the circle determined by θ.

8. Sketch one cycle of each equation.

a) $y = -\tan\left(\frac{1}{2}x + \frac{\pi}{3}\right)$ *b)* $y = \sec\left(\frac{\pi}{2}x\right) + 1$

c) $y = 2\sin\left(3x - \frac{\pi}{2}\right)$ *d)* $y = -2\csc\left(\frac{2}{3}x\right)$

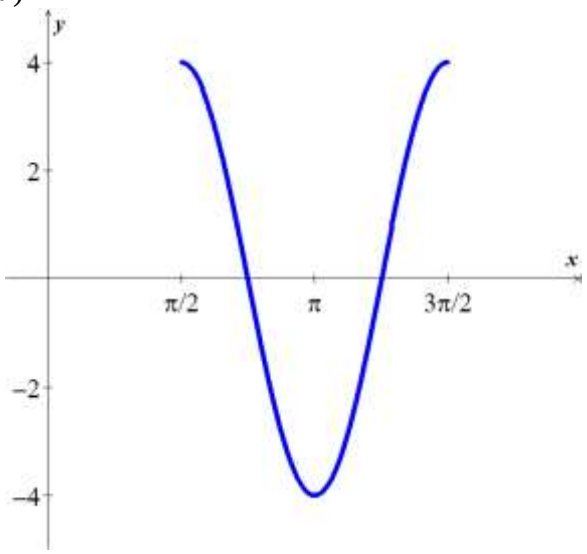
e) $y = \frac{3}{2}\cos\left(\frac{2}{3}x - \frac{\pi}{6}\right)$ *f)* $y = -3\cot\left(\frac{\pi}{4}x - \frac{\pi}{2}\right)$

9. Let $f(x) = 2\sin\left(\frac{4}{3}x - \frac{8\pi}{15}\right) + 1$. Find each of the following:

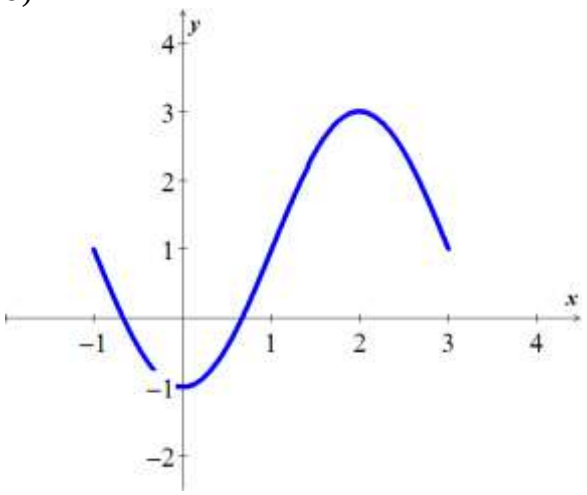
a) the period of f
b) the amplitude of f
c) the phase shift
d) the range of f

10. Find an equation of the form $y = A\cos(Bx + C) + D$ or $y = A\sin(Bx + C) + D$ for each of the following graphs:

a)



b)



Answers

1. *a*) $\frac{43\pi}{36}$ ***rad*** *b*) $\frac{13\pi}{6}$ ***rad*** *c*) $\frac{4\pi}{5}$ ***rad*** *d*) 4.36 ***rad***

2. *a*) 255° *b*) 157.5° *c*) 405°

3. *a*) $-\sqrt{2}$ *b*) $\sqrt{3}$ *c*) 4.124

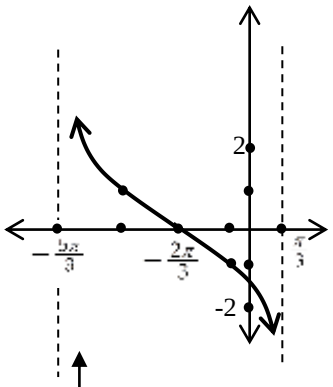
4. *a*) 40π rad/min *b*) 200π in/min *c*) 100π in

5. *a*) 94.2 rad/min *b*) 377.0 in/min

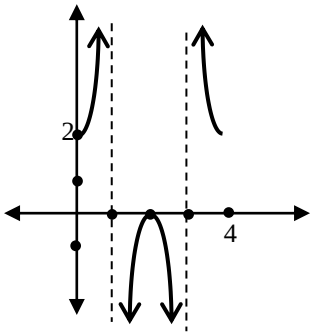
6. $6\sqrt{2}$

7. *a*) $\approx 7.819\ cm$ *b*) $31.264\ cm^2$

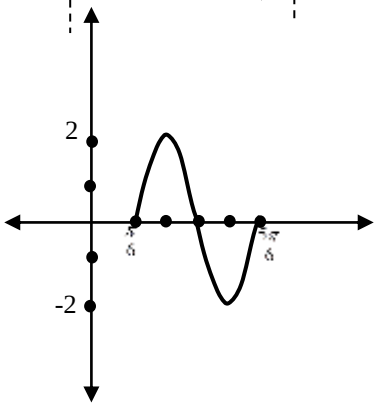
8. *a*)



b)



c)



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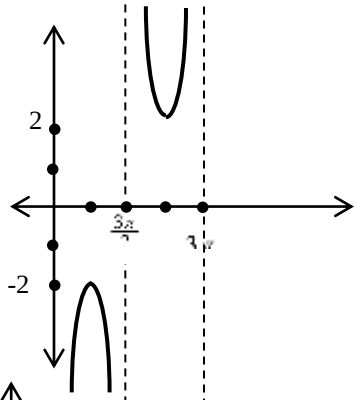
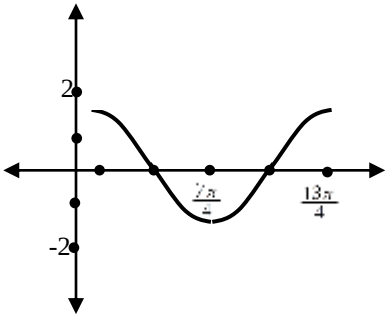
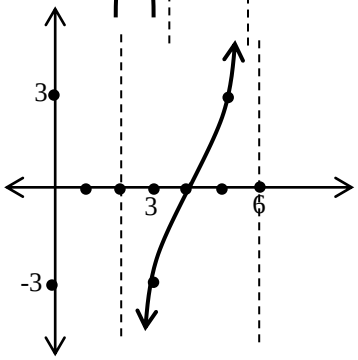


e)



f)



9. *a*) $\frac{3\pi}{2}$ *b*) 2 *c*) $\frac{2\pi}{5}$ *d*) $[-1,3]$

10. *a*) $y = 4\cos(2x - \pi)$ *b*) $y = -2\sin\left(\frac{\pi}{2}x + \frac{\pi}{2}\right) + 1$