

**2nd Semester Exam Review  
Advanced Algebra**

Name \_\_\_\_\_  
Class Hour \_\_\_\_\_

**Unit 6.1-6.3**

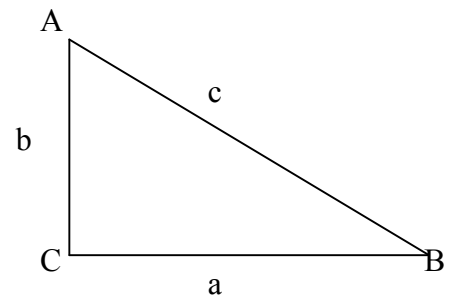
**Find the values of the other five trigonometric functions of  $\theta$  in a right triangle**

1.  $\sin \theta = \frac{3}{5}$

2.  $\sec \theta = 2$

**Solve  $\triangle ABC$  using the diagram and the given measurements— $m \angle C = 90^\circ$ .**

3.  $A = 20^\circ, c = 8$



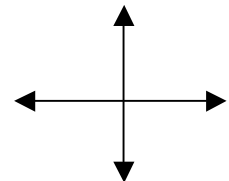
**Solve  $\triangle ABC$ .**

4.  $A = 30^\circ, c = 45, b = 60$

5.  $B = 86^\circ, b = 13, c = 11$

6. Find two angles (one positive, one negative) coterminal to  $10^\circ$ .

7a. Draw a  $-200^\circ$  angle in standard position.



7b. What is the reference angle?

a)  $200^\circ$

b)  $160^\circ$

c)  $70^\circ$

d)  $20^\circ$

8. In  $\triangle ABC$ ,  $a = 3$ ,  $b = 4$ ,  $c = 6$ . Find  $B$ .

a)  $26.38^\circ$

b)  $36.34^\circ$

c)  $72^\circ$

d)  $117.28^\circ$

9. In  $\triangle ABC$ ,  $a = 8$ ,  $b = 11$ ,  $C = 26^\circ$ . Find  $c$ .

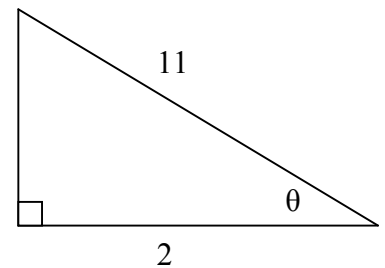
a) 5.18

b) 10.29

c) 10.38

d) 26.81

10. Using the diagram at the right, find  $\theta$ .



## Unit 6.4 – 6.6

### Section 6.4 Radians

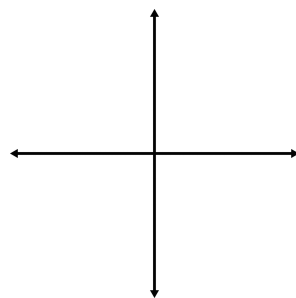
For numbers 11 and 12:

- Draw the angle with the given measure in standard position.
- Find the reference angle
- Name one positive and one negative coterminal angle

11.  $610^\circ$

b. \_\_\_\_\_

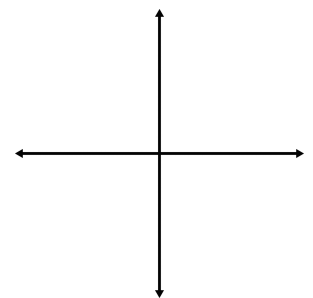
c. \_\_\_\_\_



12.  $-\frac{7\pi}{6}$

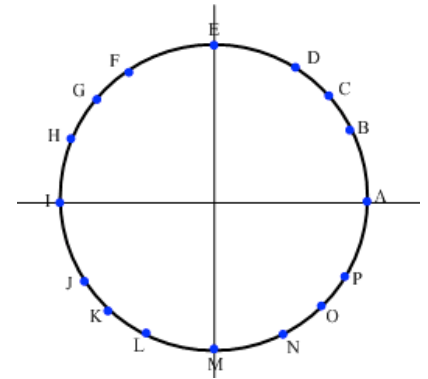
b. \_\_\_\_\_

c. \_\_\_\_\_



### Section 6.5 Unit Circle

Use the circle diagram at right to answer questions 13 – 16.



13a. Name the angle at point L (in degrees and radians).

\_\_\_\_\_

b. What is the cosine of the angle at point L? \_\_\_\_\_

c. Name another point that has an angle with the same cosine as L. \_\_\_\_\_

14. What is the tangent of the angle at point P? \_\_\_\_\_

15. Name all points of angles that have a cosine of  $-\frac{\sqrt{2}}{2}$  \_\_\_\_\_

16. Name all points of angles that have a tangent of  $\sqrt{3}$  \_\_\_\_\_

### Section 6.6 Graphing

17. Write the equation for the graph of  $y = 3\sin 2x$  that has been translated left  $90^\circ$  and down 4 units.

\_\_\_\_\_

18. Write an equation whose graph has the given characteristics:

Parent:  $y = \cos x$

Period:  $90^\circ$

Amplitude: 4

Vertical shift: Down 2

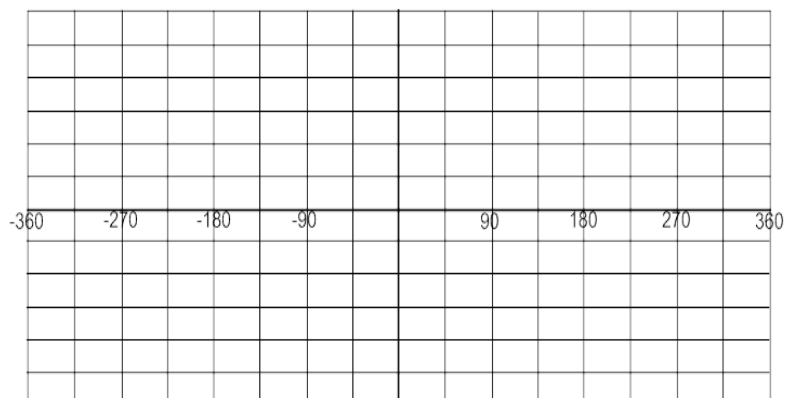
Equation: \_\_\_\_\_

**Graph the following functions:**

19.  $y = -3 \sin 2x$

Period \_\_\_\_\_ Amp \_\_\_\_\_

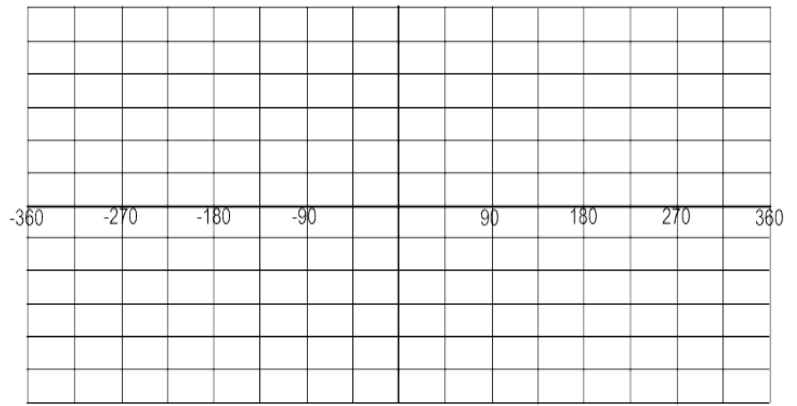
Phase shift \_\_\_\_\_ Horiz shift \_\_\_\_\_



20.  $y = 2\cos(x - 90) + 1$

Period \_\_\_\_\_ Amp \_\_\_\_\_

Phase shift \_\_\_\_\_ Horiz shift \_\_\_\_\_



**Unit 7**

**For the sequence, write a rule for the *n*th term.**

21. 11, 20, 29, 38,...

22.  $\frac{1}{27}, \frac{1}{9}, \frac{1}{3}, 1, \dots$

23. 9, 16, 25, 36,...

**Find  $a_5$  for the following problems.**

24.  $a_n = 6n - 8$

25.  $a_1 = 4, a_2 = 1$   
 $a_n = (a_{n-1}) \cdot (a_{n-2})$

**Write a recursive rule for the sequence. The sequence may be arithmetic, geometric or neither.**

26. 2.5, 5, 10, 20,...

27. 2, -2, -6, -10,...

**Write the series in summation notation.**

28.  $8 + 5 + 2 \dots - 34$

**Find the sum of the series.**

29.  $\sum_{n=1}^{20} 2(3)^{n-1}$

30.  $4 + 8 + 12 + \dots + 1000$

## Unit 8

31. Evaluate the logarithm without using a calculator.

a.  $\log_4 \frac{1}{16}$

b.  $\log_6 6$

c.  $\log_5 125$

d.  $\log_3 x = 3$

32. Expand the expression.

a.  $\log_5 \frac{2\sqrt{w}}{4y^5}$

b.  $\ln 20x^3y^2$

33. Condense the expression.

a.  $\frac{1}{2} \ln 100 - 2 \ln x + 8 \ln y$

b.  $4 \log_3 x + \log_3 y - 2 \log_3 z$

34. State the domain and range of the function and if it will be growth or decay.

a.  $y = .25 \left( \frac{4}{3} \right)^{x-4} + 7$

b.  $y = 10 \left( \frac{3}{5} \right)^{x+8}$

Domain: \_\_\_\_\_

Domain: \_\_\_\_\_

Range: \_\_\_\_\_

Range: \_\_\_\_\_

Growth or Decay: \_\_\_\_\_

Growth or Decay: \_\_\_\_\_

35. Find each to three decimal places.

a.  $\log_4 80$

b.  $\log_5 100$

**36.** The value of a car depreciates at a rate of 11% per year. If it originally cost \$24,000 how much will the car be worth 8 years from purchase? Write a formula and solve.

**37.** Using the equation in #36. When will the car be worth \$5000?

**38.** You deposited \$500 into a bank account earning 6.5% annual interest. How much money will you earn in two years if the interest is compounded:

**a.** Annually

**b.** Continuously

**c.** Monthly

**39.** Solve the equation.

**a.**  $7^{9x} = 18$

**b.**  $3e^{3x} + 7 = 31$

**c.**  $9^{2x} = 3^{2x+4}$

**d.**  $\ln(3x + 7) = \ln(x - 1)$

**e.**  $\log_5(3x + 2) = 3$

**f.**  $\log_6(x+9) + \log_6 x = 2$

**40.** What was your favorite unit this semester?

### 9.1 Simplifying, Multiplying, and Dividing Rational Expressions

41.  $\frac{3x}{3x-6}$

42.  $\frac{x^2+5x+4}{x^2-16}$

43.  $\frac{32x^4y}{3xy^2} \div \frac{8xy^2}{21y^4}$

44.  $\frac{x^2-4}{2x+2} \cdot \frac{x^2-5x-6}{x^2-6x+8}$

### 9.2 Adding and Subtracting Rational Expressions

45. What is the LCD of  $\frac{x}{3x(x+3)}$  and  $\frac{1}{x^2-9}$  and  $\frac{4}{x(x-3)}$ ?

A. 3

B.  $3x(x+3)^2(x-3)$

C.  $3x^2(x+3)(x-3)$

D.  $3x(x^2-9)$

46.  $\frac{2x}{x^2+8x+16} + \frac{x-1}{x^2+4x}$

47.  $\frac{x-2}{x^2+x-12} - \frac{x}{x^2-2x-3}$

### 9.3 Solving Rational Equations

48.  $\frac{2x-6}{x-6} = \frac{x}{x+2}$

49.  $\frac{-x+1}{x-1} + 2 = \frac{1}{x}$

50.  $\frac{3}{x} + \frac{x}{x-4} = \frac{16}{x^2-4x}$