ALGEBRA 2 CP FINAL EXAM REVIEW

Algebra 2 CP

FINAL EXAM REVIEW

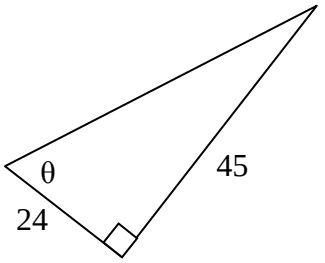
Name_____

CHAPTER 13 - TRIGONOMETRY

Note: always round sides to the nearest tenth and angles to the nearest degree.

Find the values of the six trigonometric functions for angle θ.

1.



1. $\sin\theta$ _____

$\cos\theta$ _____

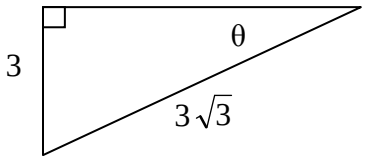
$\tan\theta$ _____

$\csc\theta$ _____

$\sec\theta$ _____

$\cot\theta$ _____

2.



2. $\sin\theta$ _____

$\cos\theta$ _____

$\tan\theta$ _____

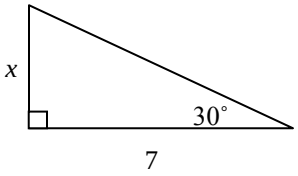
$\csc\theta$ _____

$\sec\theta$ _____

$\cot\theta$ _____

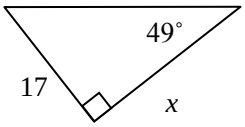
Write an equation involving sin, cos, or tan that can be used to find x, then solve.

3.



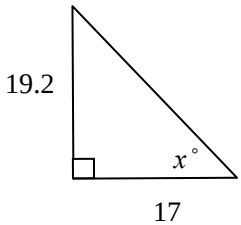
3._____

4.



4._____

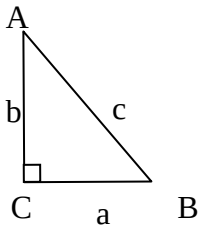
5.



5._____

Solve ΔABC by using the given measurements.

6. $A = 35°, a = 12$



7. $b = 52, c = 95$

6. B =

b =

c =

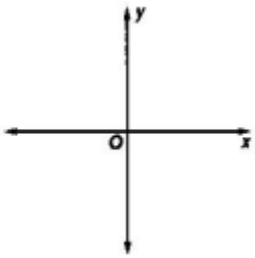
7. a =

A =

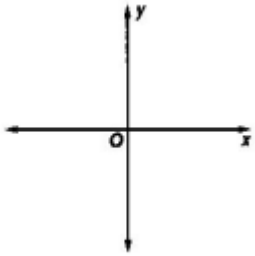
B =

Draw an angle with the given measure in standard position.

8. 210°



9. -560°



Rewrite each degree measure in radians and each radian measure in degrees.

10. -18°

11. 870°

12. $\frac{5\pi}{2}$

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

10._____

11._____

12._____

13._____

Find one angle with positive measure and one angle with negative measure coterminal with each angle.

14. 80°

15. $\frac{2\pi}{5}$

16. -93°

17. $-\frac{5\pi}{12}$

14._____

15._____

16._____

17._____

Find the reference angle for the angle with the given measure.

18. -210°

19. $\frac{13\pi}{3}$

18._____

19._____

Find the exact value of each trigonometric function.

20. $\tan 135^\circ$

21. $\cot(-90^\circ)$

22. $\tan\frac{5\pi}{3}$

23. $\csc\left(-\frac{3\pi}{4}\right)$

20._____

21._____

22._____

23._____

24. Solve ΔABC if $A = 50°$, $B = 30°$, and $c = 9$.

24. C = _____

a = _____

b = _____

Determine whether each triangle has one, two or no solutions, then solve each triangle.

25. $A = 29°$, $a = 6$, $b = 13$

25._____

_____

26. $A = 66°$, $a = 12$, and $b = 7$

26._____

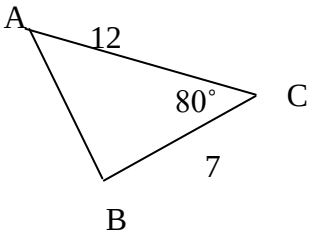
_____

27. $A = 45°$, $a = 15$, and $b = 18$

27._____

_____

Solve the following triangles.

28. 

28._____

29. $a = 16$, $b = 20$, $C = 54°$

29._____

Solve the following triangles completely.

30. $a = 8$, $b = 6$, $c = 9$

30._____

31. $B = 47°$, $C = 112°$, $b = 13$

31._____

Find the exact value of each function.

32. $\cos\frac{7\pi}{4}$

33. $\sin(-330^\circ)$

32._____

33._____

34. $\sin\left(-\frac{2\pi}{3}\right)$

35. $\cos\ 840^\circ$

34._____

35._____

Solve each equation by finding the value of x.

36. $Sin^{-1}(-1) = x$

37. $x = Arc\tan 0$

36._____

37._____

38. $x = Arc\cos\ \frac{1}{2}$

39. $Arc\tan\left(-\frac{\sqrt{3}}{3}\right)$

38._____

39._____

Find each value. Write angle measures in radians.

40. $Sin^{-1}\frac{\sqrt{2}}{2}$

41. $Tan^{-1}\left(-\sqrt{3}\right)$

40._____

41._____

Find the value of each expression.

42. $\cos\theta$, if $\tan\theta = -\frac{4}{3};\ 90^\circ < \theta < 180^\circ$

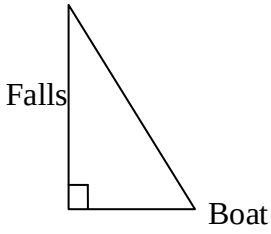
42._____

43. $\sin\theta$, if $\cos\theta = \frac{6}{7};\ 270^\circ < \theta < 360^\circ$

43._____

44. In a sightseeing boat near the base of the Horseshoe Falls at Niagara Falls, a passenger estimates the angle of elevation to the top of the Falls to be 35°. If the Horseshoe Falls are 173 feet high, what is the distance from the boat to the base of the falls?

44._____



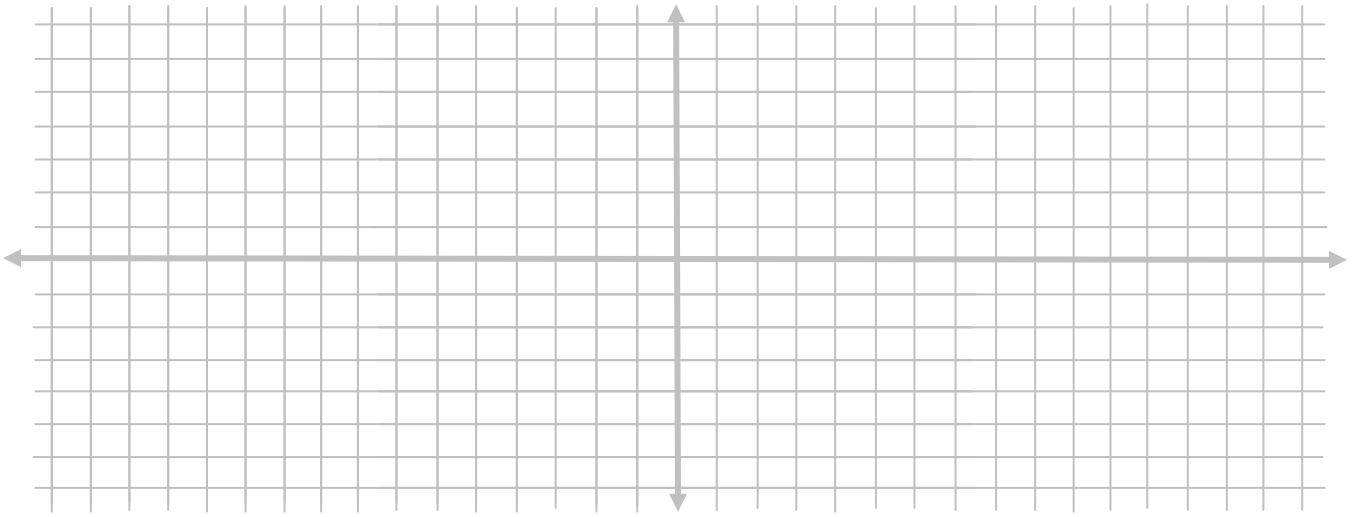
CHAPTER 14 – GRAPHING SINE AND COSINE

1. Given, $y = 4\sin\frac{1}{2}\theta$ find the following in radians:

   a. Amplitude 1 a._____

   b. Period b._____

   c. Graph one positive and one negative period. (be sure to label graph)

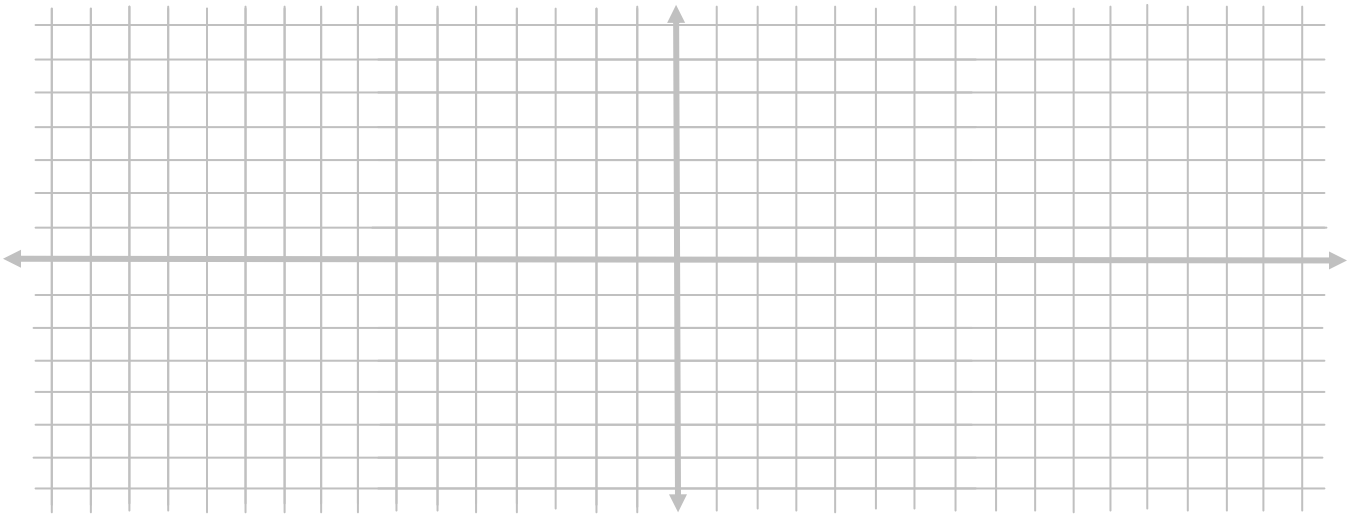


2. Given, $y = \frac{1}{2}\cos 4\theta$ find the following in radians:

   a. Amplitude 2 a._____

   b. Period b._____

   c. Graph one positive and one negative period. (be sure to label graph)



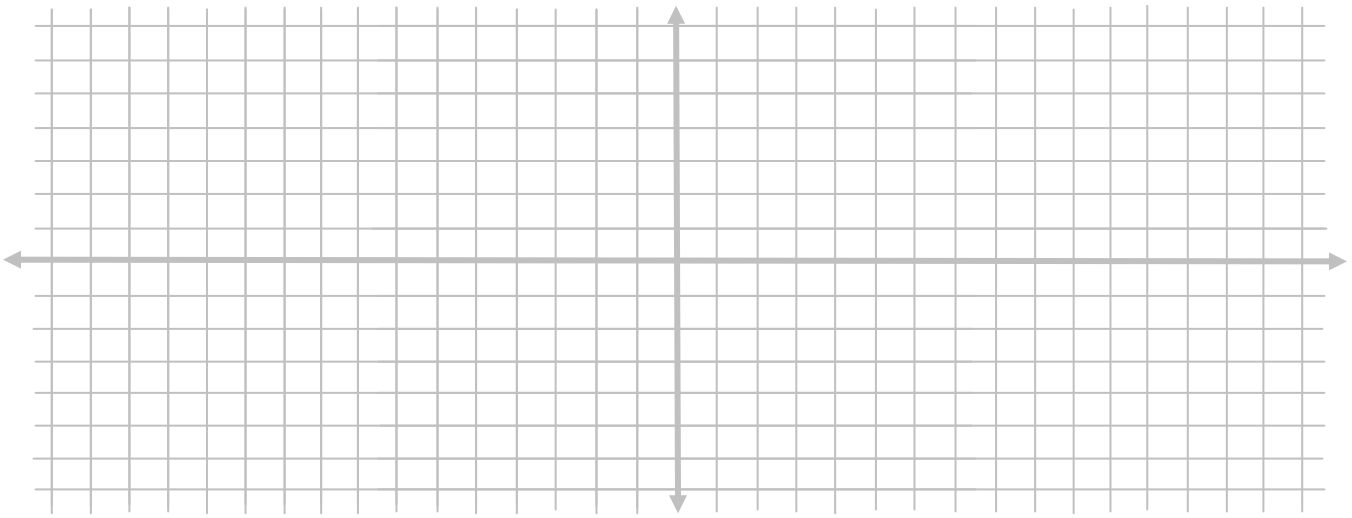
3. Given, $y = 3\cos\left(\theta - \frac{\pi}{2}\right)$ find the following:

a. Amplitude 3 a._____

b. Period b._____

c. Phase Shift c._____

d. Graph one positive and one negative period. (be sure to label graph)



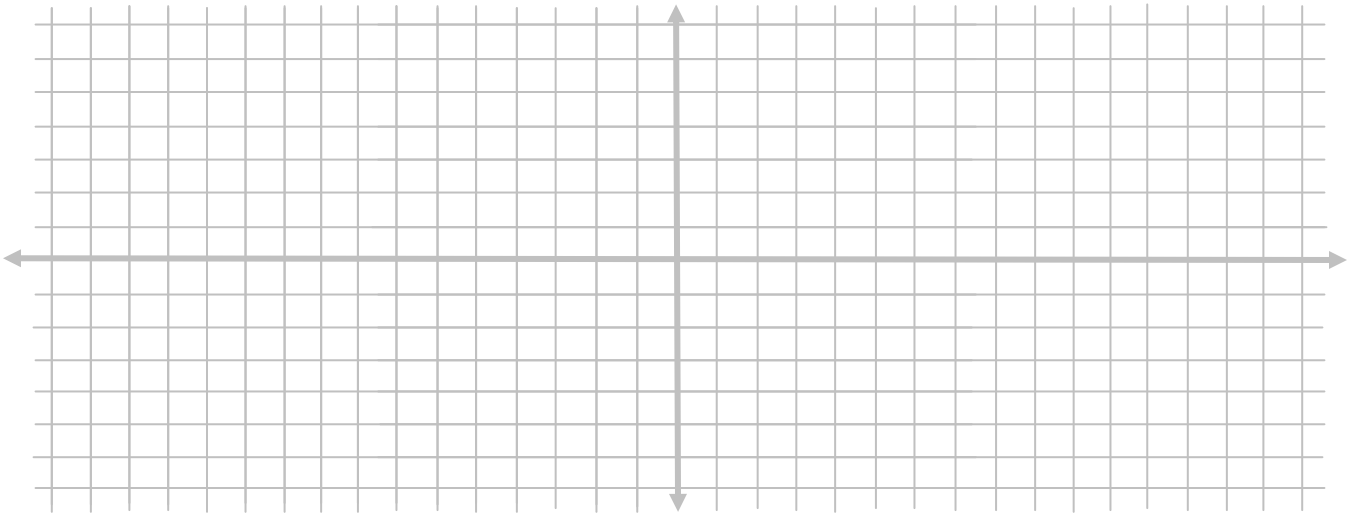
4. Given, $y = 2\sin\theta - 1$ find the following in radians:

a. Amplitude 4 a._____

b. Period b._____

c. Vertical Shift c._____

d. Graph one positive and one negative period. (be sure to label graph)



CHAPTER 8 – RATIONAL EXPRESSIONS

Simplify each expression.

1. $\dfrac{21x^3y}{14x^2y^2}$

2. $\dfrac{x^2+x-6}{x^2-6x-27}$

1._____

2._____

3. $\dfrac{(m-3)^2}{m^2-6m+9} \bullet \dfrac{m^3-9m}{m^2-9}$

4. $\dfrac{c^2-3c}{c^2-25} \bullet \dfrac{c^2+4c-5}{c^2-4c+3}$

3._____

4._____

5. $\dfrac{6xy^4}{25z^3} \div \dfrac{18xz^2}{5y}$

6. $\dfrac{16p^2-8p+1}{14p^4} \div \dfrac{4p^2+7p-2}{7p^5}$

5._____

6._____

7. $\dfrac{3}{8p^2q} + \dfrac{5}{4p^2q}$

8. $\dfrac{4z}{z-4} + \dfrac{z+4}{z+1}$

7._____

8._____

9. $\dfrac{3}{w-3} - \dfrac{2}{w^2-9}$

10. $\dfrac{5}{3b+d} - \dfrac{2}{3bd}$

9._____

10._____

Determine any value(s) of x that are undefined.

11. $f(x) = \dfrac{3x-1}{3x^2+5x-2}$

12. $f(x) = \dfrac{x^2-x-12}{x^2-4x}$

11._____

12._____

Solve the following.

13. $\frac{3}{x+1}=\frac{9}{4x+5}$

14. $\frac{3}{2}+\frac{4}{x-1}=\frac{x+1}{x-1}$

13._____

14._____

15. $1-\frac{8}{x-5}=\frac{3}{x}$

16. $\frac{6}{x-3}=\frac{8x^2}{x^2-9}-\frac{4x}{x+3}$

15._____

16._____

17. $\frac{x+1}{x+6}+\frac{1}{x}=\frac{2x+1}{x+6}$

18. $\frac{2}{x-3}+\frac{1}{x}=\frac{x-1}{x-3}$

17._____

18._____

19. Find the product: $\frac{x^2-11x+24}{x^2-18x+80}\cdot\frac{x^2-15x+50}{x^2-9x+20}$

19._____

20. Solve: $\frac{2}{x-1}=4-\frac{x}{x-1}$

20._____

21. Solve: $\frac{9}{x-3}=\frac{x-4}{x-3}+\frac{1}{4}$

21._____

22. Dave can paint a room in 6 hours. Tom can paint the same room in 4 hours. If they work together, how long will it take both of them to paint the room?

22._____

Graph the following – be sure to include the vertical and horizontal asymptotes.

23. $y = \frac{2}{x-1} - 3$

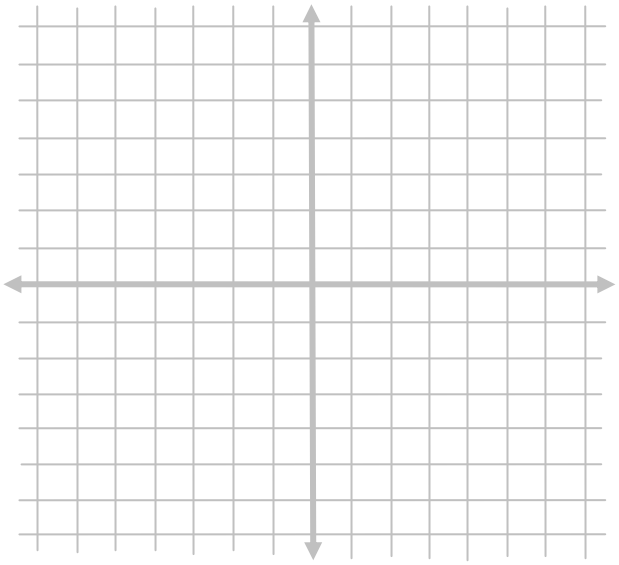
Vertical Asymptote: _____

Horizontal Asymptote: _____

Domain: _____

Range: _____

x	*y*



24. $y = \frac{6x-1}{3x+6}$

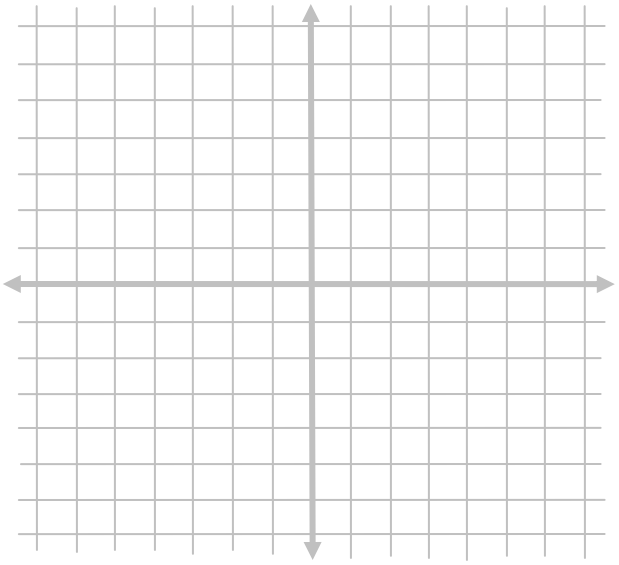
Vertical Asymptote: _____

Horizontal Asymptote: _____

Domain: _____

Range: _____

x	*y*



25. $y = \frac{x}{x^2-4}$

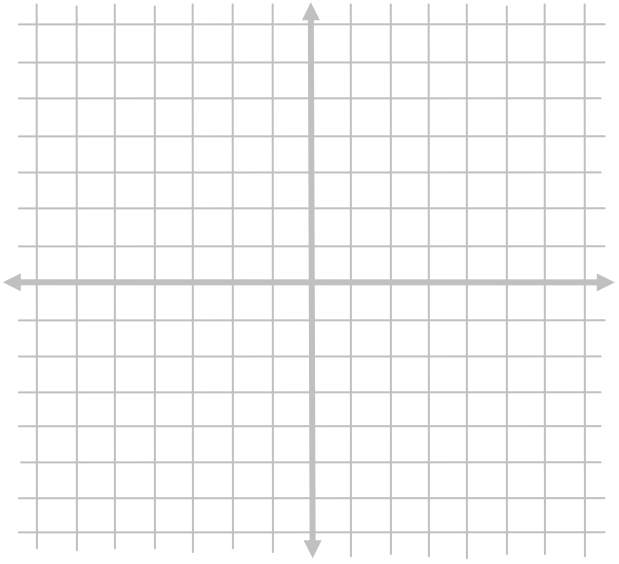
Vertical Asymptote: _____

Horizontal Asymptote: _____

Domain: _____

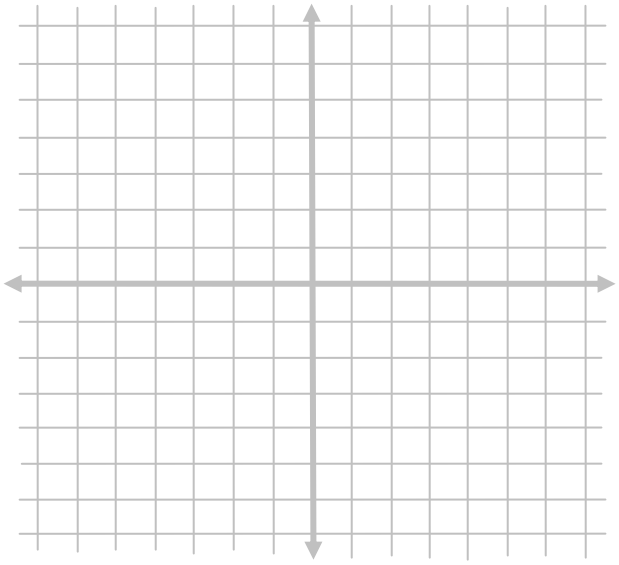
Range: _____

x	*y*



26. $y = \dfrac{x^2 - 2x + 1}{x + 2}$

x	*y*



Vertical Asymptote: _____

Horizontal Asymptote: _____

Domain: _____

Range: _____

CHAPTER 12 – SEQUENCES AND SERIES

Write a rule for the nth term of the arithmetic sequence.

1. 8, 5, 2, -1, -4, …
2. $d = 7$, $a_8 = 54$
3. $a_4 = 27$, $a_{11} = 69$

1._____

2._____

3._____

Find the sum of the series.

4. $\sum_{n=1}^{6}\left(n^2 + 7\right)$
5. $\sum_{n=2}^{6}\left(10 - 4n\right)$
6. $\sum_{n=1}^{17} n$

4._____

5._____

6._____

7. $\sum_{i=1}^{15}\left(3 + 2i\right)$
8. $\sum_{i=1}^{26}\left(25 - 3i\right)$
9. $\sum_{i=1}^{22}\left(6i - 5\right)$

7._____

8._____

9._____

10. Joe buys a $600 computer on layaway by making a $200 down payment and then paying $25 per month. Write a rule for the total amount of money paid on the computer after *n* months.

10._____

Write a rule for the nth term of the geometric sequence.

11. $256, 64, 16, 4, 1, \ldots$

12. $r = 5, a_2 = 200$

13. $a_3 = 16, a_5 = \frac{16}{9}$

11._____

12._____

13._____

Find the sum of the series, if it exists. If it does not exist, write "no limit exists."

14. $\sum_{i=1}^{9} 8(2)^{i-1}$

15. $\sum_{i=1}^{7} 40\left(\frac{1}{2}\right)^{i-1}$

16. $\sum_{i=1}^{\infty} 3\left(\frac{5}{8}\right)^{i-1}$

14._____

15._____

16._____

17. $\sum_{i=1}^{\infty} 7\left(-\frac{3}{4}\right)^{i-1}$

18. $\sum_{i=1}^{\infty} 4(1.25)^{i-1}$

19. $\sum_{i=1}^{\infty} \frac{2}{3}(-3)^{i-1}$

17._____

18._____

19._____

Write the first five terms of the sequence.

20. $a_1 = 4, a_n = a_{n-1} + 9$

21. $a_1 = 8, a_n = 5a_{n-1}$

20._____

21._____

22. $a_1 = 2, a_n = n \cdot a_{n-1}$

23. $a_1 = 4, a_2 = 7, a_n = a_{n-1} + a_{n-2}$

22._____

23._____

Write a recursive rule for the sequence.

24. $2, 12, 72, 432, \ldots$ 25. $3, 10, 17, 24, \ldots$ 24._____

25._____

Find the first three iterates of the function for the given initial value.

26. $f(x) = 3x - 7,\ x_0 = 4$ 27. $f(x) = 8 - 5x,\ x_0 = 1$ 26._____

27._____

CHAPTER 10 – COUNTING METHODS AND PROBABILITY

1. A briefcase lock has 3 rotating cylinders each containing 10 digits. How many numerical codes are possible? 1._____

2. Allan is playing the role of Oliver in his school's production of *Oliver Twist*. The wardrobe crew has presented Allan with 5 pairs of pants and 4 shirts that he can wear. How many possible costumes consisting of a pair of pants and a shirt does Allan have to choose from? 2._____

3. A Mexican restaurant offers chicken, beef, or vegetarian fajitas wrapped with either corn or flour tortillas, and topped with either mild, medium or hot salsa. How many different choices of fajitas does a customer have? 3._____

4. How many 7-digit phone numbers can be formed if the first digit cannot be 0 or 1, and no digit can be repeated? 4._____

Determine whether each situation involves a permutation of combination. Then find the number of possibilities.

5. Seating 8 students in 8 seats in the front row of the school auditorium. 5._____

6. Checking out 3 library books from a list of 8 books for a research paper. 6._____

7. Electing 4 candidates to a municipal planning board from a field of 7 candidates. 7._____

8. The first, second and third place finishers in a race with 10 contestants. 8._____

Evaluate.

9. ${}_5P_3$ 10. ${}_6C_2$ 11. $6!$ 12. $\dfrac{10!}{5!\,5!}$

9._____

10._____

11._____

12._____

13. Find the number of distinguishable permutations in the following word:

a. PANAMA b. FACTORIAL c. MISSISSIPPI

13 a._____

b._____

c._____

14. Find the number of possible 5-card hands that contain the cards specified. The cards are taken from a standard 52-card deck.

a. 4 kings and one other card

14 a._____

b. 5 hearts or 5 diamonds

b._____

15. Use the binomial theorem to write the binomial expression: a) $(x+3)^6$; b) $(a+3b)^4$; c) $(x^2-3)^5$

15 a._____

15 b._____

15 c._____

16. Six representatives from a senior class of 350 students are to be chosen for the student council. In how many ways can these students be chosen to represent the senior class on the student council?

16._____

17. You have an equally likely chance of choosing any integer from 1 through 30. Find the probability of the given event.

a. An even number is chosen

b. A multiple of 5 is chosen

c. A factor of 60 is chosen

d. A prime number is chosen

17 a._____

b._____

c._____

d._____

18. Let A and B be events such that $P(A) = \frac{2}{3}$, $P(B) = \frac{1}{2}$ and $P(A \text{ and } B) = \frac{1}{3}$. Find $P(A \text{ or } B)$.

18._____

19. Let A and B be events such that P(A) = 0.32, P(B) = 0.48, and P(A and B) = 0.12. Find the indicated probability.

a. $P(A \text{ or } B)$ b. $P(\overline{A})$ c. $P(\overline{B})$

19 a._____

b._____

c._____

20. A card is randomly selected from a standard deck of 52 cards. Find the probability of drawing the given card.

a. A red king b. A diamond c. Not a club

20 a._____

b._____

c._____

21. Two six-sided dice are rolled. Find the probability of the given event.

a. The sum is not 7 b. The sum is less than 8 or greater than 11

21 a._____

b._____

Find the odds in favor of an event, given the probability of the event.

22. $\frac{3}{7}$ 23. $\frac{4}{5}$ 24. $\frac{1}{15}$

22._____

23._____

24._____

Find the probability of an event occurring, given the odds of the event.

25. 10:1 26. 4:9 27. 8:3 25._____

26._____

27._____

28. A die is rolled twice. Find the probability.
    a. $P(5, \text{then } 6)$ 28 a._____

    b. $P(4, \text{then not } 6)$ b._____

29. There are 3 nickels, 3 dimes and 5 quarters in a purse. Three coins are selected in succession at random. Find the probability.
    a. *P*(nickel, then dime, then quarter) if no replacement occurs. 29 a._____

    b. *P*(3 dimes) if replacement occurs. b._____

    c. *P*(nickel, then 2 quarters) if replacement occurs. c._____

    d. *P*(3 quarters) if no replacement occurs. d._____

30. Serena is creating a painting. She wants to use 2 more colors. She chooses randomly from 6 shades of red, 10 shades of green, 4 shades of yellow, 4 shades of purple and 6 shades of blue. What is the probability that she chooses 2 shades of green?

30._____

31. Becky's mother is shopping at the bakery. The owner offers Becky a cookie from a jar containing 22 chocolate chip cookies, 18 sugar cookies and 15 oatmeal cookies. Without looking, Becky selects one, drops it back in, and then randomly selects another. What is the probability that neither selection was a chocolate chip cookie?

31._____

32. A die is rolled. Find each probability.

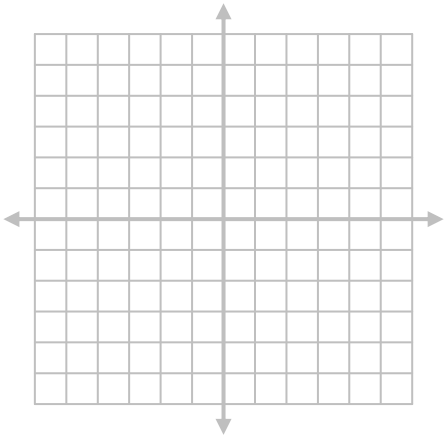
a. *P*(5 or 6) b. *P*(at least a 3) 32 a._____

b._____

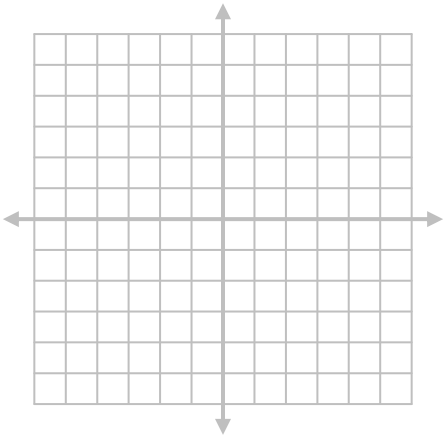
CHAPTER 9 – CONICS

Determine the conic represented by the following equations. Then, find all necessary information and graph the following equations.

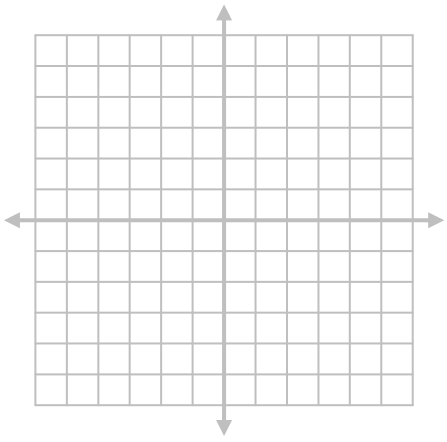
1. $(x+5)^2+(y-2)^2=16$



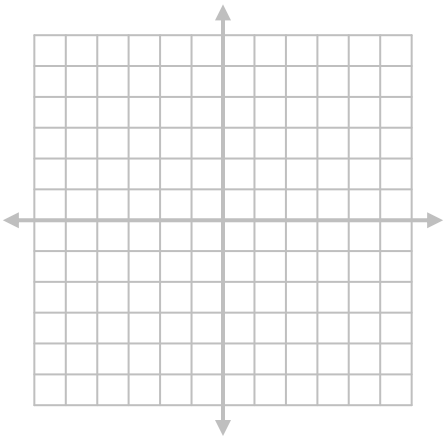
2. $(y+1)^2-\frac{(x-2)^2}{9}=1$



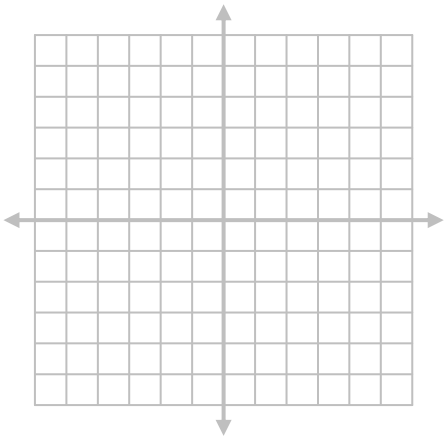
3. $x=3(y+1)^2-3$



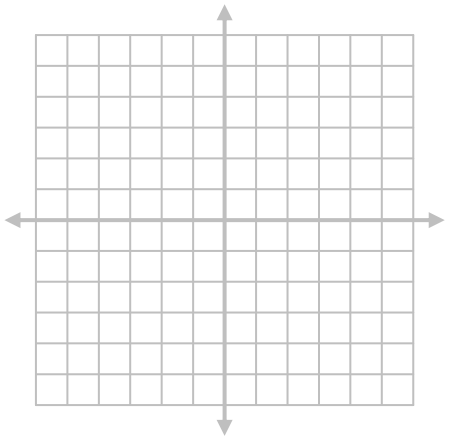
4. $\frac{(x+1)^2}{9}+\frac{(y-2)^2}{4}=1$



5. $\frac{(x-1)^2}{4} - \frac{(y+2)^2}{9} = 1$



6. $y = (x-2)^2 + 1$



Write an equation given the following information.

7. Circle Center: (-2, 4) and a point on the circle (-7, 5) 7._____

8. Parabola Vertex:(-3, -4) Focus: $\left(-3, \frac{15}{4}\right)$ 8._____

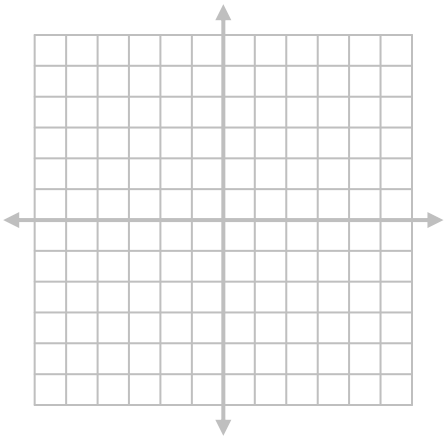
9. Parabola Vertex: (1, 3) Directrix: $x = \frac{7}{8}$ 9._____

10. Ellipse Vertices: (4, 2) (4, -8) Co-vertices: (1, -3) (7, -3) 10._____

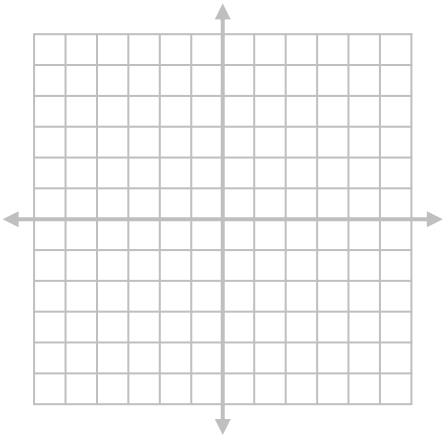
11. Hyperbola Vertices: (-4, 3) (-4, 7) Foci: (-4, 1) (-4, 9) 11._____

Identify the vertices, foci, co-vertices, and directrix from the graph – if they exist.

12. $(y+2)^2 = \frac{1}{2}(x+3)$



13. $\frac{(y+5)^2}{16} - \frac{(x+4)^2}{9} = 1$



12. V _____

F _____

CV _____

d _____

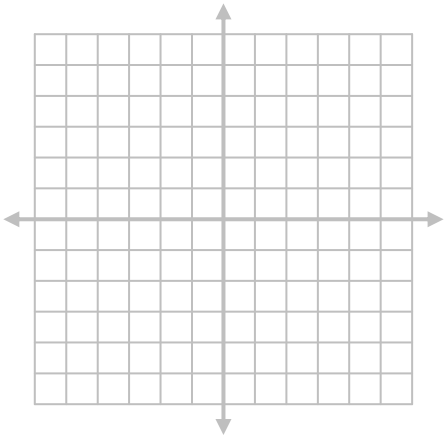
13. V _____

F _____

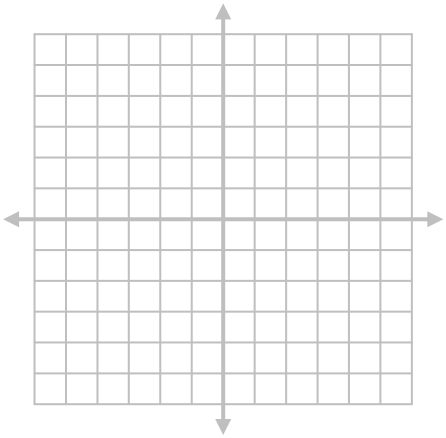
CV _____

d _____

14. $\frac{(x-4)^2}{36} + \frac{(y+2)^2}{7} = 1$



15. $(x+4)^2 + (y-2)^2 = 25$



14. V _____

F _____

CV _____

d _____

15. V _____

F _____

CV _____

d _____

Without graphing, identify the conic from the equation.

16. $\frac{(x+1)^2}{16} - \frac{(y-2)^2}{7} = 1$

17. $x = (y-2)^2 + 3$

16._____

17._____

18. $\frac{(x-3)^2}{5} + (y+2)^2 = 1$

19. $(x-2)^2 + (y+3)^2 = 25$

18._____

19._____