

Algebra 2

Second Semester Review

Name _____

Non-Calculator

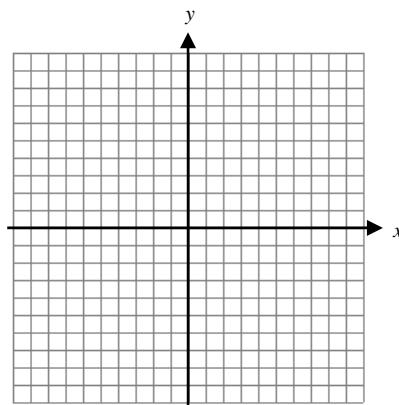
1.3 Use the matrices below for questions 1 and 2.

$$A = \begin{bmatrix} -2 & 1 & 5 \\ 3 & 7 & -6 \end{bmatrix} \quad B = \begin{bmatrix} 4 & 0 & 9 \\ 2 & 8 & -7 \end{bmatrix}$$

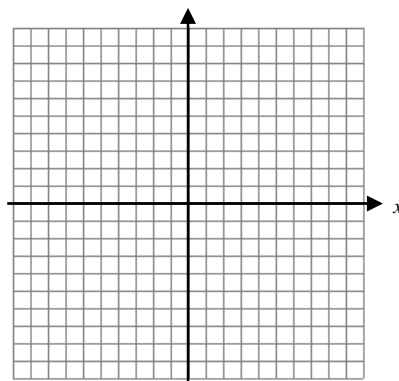
1. $B - A$

2. $2A + B$

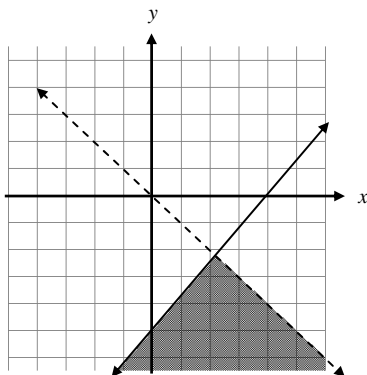
7.4 3. Graph: $x - 2y < -2$



7.5 4. Graph:
 $4x + 3y > 12$
 $x \geq y$
 $x \leq 7$



5. Write the system of inequalities defining the shaded region.



8.1

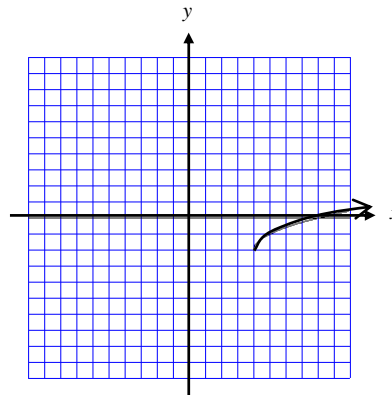
6. Which function matches the graph?

(a) $f(x) = \sqrt{x+4} + 2$

(b) $f(x) = \sqrt{x-4} - 2$

(c) $f(x) = \sqrt{x+4} - 2$

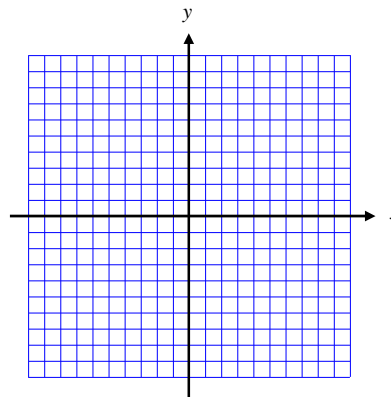
(d) $f(x) = \sqrt{x-4} + 2$



7. State the domain and range of each radical function.

a. $y = \sqrt{x} + 3$

b. $y = \sqrt[3]{x-4}$

8. Graph : $y = -\sqrt{x} - 5$ 

8.2

9. Simplify if the domain is the set of all complex numbers.

a) $\sqrt[3]{\frac{250}{8}}$

b) $\sqrt{-64}$

8.4

10. Find the complex conjugate: $4 + 3i$ 11. Use complex conjugates to write the quotient in $a + bi$ form: $\frac{8+5i}{5+3i}$ 12. Simplify: $(-4 - 4i) + (-9 + 8i)$

9.3 13. Describe the end behavior of each function:

a) $f(x) = -4x^6 - 3x^5 + 2x - 1$

b) $f(x) = 4x^3 - 2x^2 - 5x + 3$

Trig #4 14. Convert each angle measure from radians to degrees.

a) $\frac{5\pi}{3}$

b) 3π

c) $-\frac{3\pi}{4}$

15. Convert each angle measure from degrees to radians.

a) 45°

b) -270°

c) -60°

Trig #2 16. Sketch each angle and identify the quadrant the terminal side of each angle is in. Then find the reference angle in degree measure.

a) 125°

b) -60°

c) 225°

d) -315°

17. Sketch each angle and identify the quadrant the terminal side of each angle is in. Then find the reference angle in radian measure.

a) $-\frac{5\pi}{6}$

b) $\frac{3\pi}{5}$

c) $-\frac{7\pi}{4}$

d) $\frac{23\pi}{12}$

Graphing Calculator

In questions 1 and 2, use a graphing calculator to solve each system. (The graphs of the equations may intersect more than once.)

7.1 1. $y = 3(2)^x$
 $y = 9 - 5x$

2. $y = x^2 - 1$
 $y = 3x$

In questions 3 - 6, solve each system algebraically or with matrices.

7.1 3. $x - 4y = 4$
 $y = x + 2$

7.2-3 4. $2x - 4y = -1$
 $x + 4y = -2$

5. $2x - 4y = -4$
 $4x - 8y = -2$

6. $5x - 4y - 8z = 10$
 $7x - 11y - 2z = 13$
 $-3x - y - 3z = 17$

8.2 7. Simplify the expression. Assume $x \geq 0$: $\sqrt[3]{54x^4}$

For questions 8 - 10, solve. Check to eliminate extraneous solutions.

8. $\sqrt{2x+6} = 4$

9. $\sqrt[3]{5x-7} + 11 = 8$

10. Multiple choice: $\sqrt{x+7} = x-13$

- (a) 18, 9 (b) No real number solution (c) 9 (d) 18

11. Express using fractional exponents: $\sqrt[3]{h^2}$

9.1 12. Add: $(3x^2 + 3x + 5) + (-2x^2 + 4x + 2)$

13. Subtract: $(7x^3 - 4x) - (-6x - 5 + 5x^3)$

9.2 14. Multiply: $(x-1)(x^2 - 3x - 5)$

For questions 15 and 16, divide.

15. $\frac{12x^3 - 19x - 12}{2x - 3}$

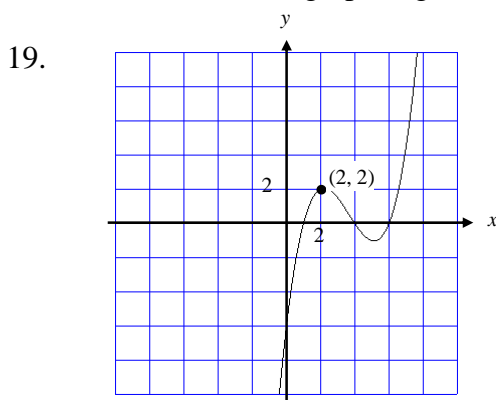
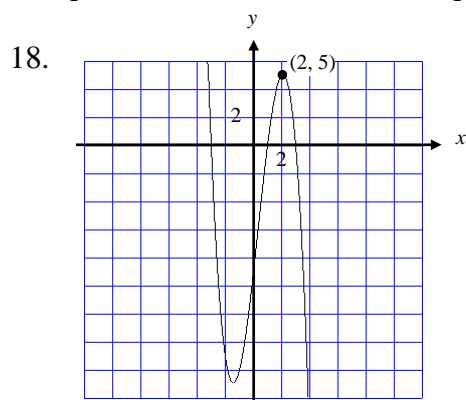
9.2 16. Multiple Choice: $\frac{2y^2 - 2y + 2}{y + 2}$

(a) $3y + 6 + \frac{10}{y + 2}$ (b) $2y - 6 + \frac{-14}{y + 2}$

(c) $2y + 2 + \frac{8}{y + 2}$ (d) $2y - 6 + \frac{14}{y + 2}$

9.4 17. Given: $f(x) = x^3 - 4x^2 - x + 4$. Find all real and/or imaginary zeros of the function.

For questions 18 and 19, find an equation for the cubic function whose graph is given.



For questions 20 and 21, tell whether y varies inversely with x. If so, write an equation giving y as a function of x.

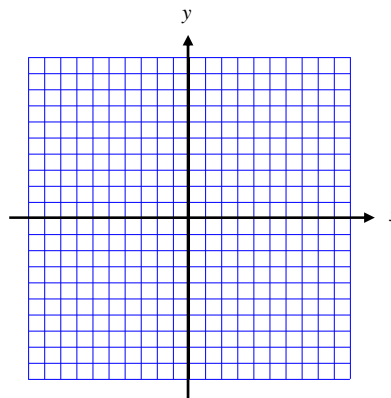
9.6 20.

x	3	8	-0.4
y	7	19	30

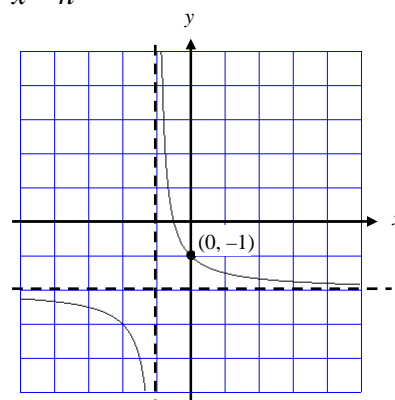
21.

x	5	4	-0.2
y	2	2.5	-50

- 9.7 22. Sketch a graph of $f(x) = \frac{x+2}{x+3}$. Include any vertical or horizontal asymptotes.



23. Find an equation of the hyperbola in the form $y = \frac{a}{x-h} + k$



For questions 24 and 25, solve the equation:

9.9 24. $\frac{x}{x+4} - \frac{1}{5} = -\frac{4}{x+4}$

25. $\frac{2}{x-10} + \frac{3x}{x-4} = 5$

12.3 26. To register at AAHS as a senior, you may choose from four math classes, five English classes, three social studies classes and four science classes. How many choices are there if you choose one of each subject?

27. Simplify: ${}_{15}P_3$

28. In how many ways can you arrange the letters in the word ALABAMA?

29. In how many ways can five pictures be arranged on a wall?

12.4 30. In how many ways can 3 students of a class of 15 art students and 4 students from a class of 33 music students be chosen to form a committee?

For questions 31 and 32, find the probability of choosing each type of card at random from a standard deck.

13.1 31. A red card or a black two.

32. A face card or a ten.

For questions 33 and 34, suppose a card is drawn at random from a standard deck of 52 playing cards. The card is placed back in the deck, and a card is again drawn at random. Find the probability of each event.

13.2 33. The first card is a club and the second card is a face card.

34. At least one of the two cards is a heart.

For questions 35 through 38, two cards are drawn at random from a standard deck of 52 playing cards. The first card is not returned to the deck before the second card is drawn. Find the probability of each event.

13.3

35. The first card is a ten and the second card is a ten
36. Neither card is a face card.
37. The second card is a heart, given that the first card is a spade.
38. The second card is a Jack, given that first card is a 9.

39. The following table lists the kinds of volunteer work undertaken by students at a high school on Community Action Day.

	Blue Team	Red Team	Green Team	Yellow Team	Total
Litter Pickup	40	50	25	30	145
Urban Gardening	35	45	50	35	165
Day Care	55	25	35	45	160
Homeless Shelter	30	35	30	40	135
Total	160	155	140	150	605

Suppose a student participating in Community Action Day is chosen at random. Find each probability.

- a) $P(\text{green})$
- b) $P(\text{homeless shelter})$
- c) $P(\text{day care} \mid \text{blue})$
- d) Probability that they are on the red team, given that they're at the homeless shelter.

For questions 40 – 43, make a sketch of right $\triangle ABC$ with right angle at C. Find each missing angle and side of $\triangle ABC$.

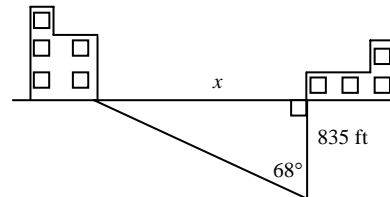
Trig #1 40. $\angle A = 28^\circ$, $b = 3$

41. $c = 110$, $b = 29.1$

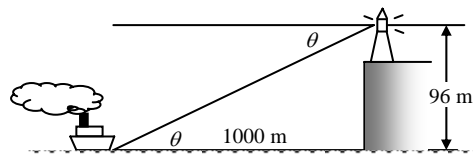
42. $\angle B = 56^\circ$, $c = 18.2$

43. $\tan A = \frac{2}{3}$

44. Two buildings are located as shown in the diagram. Find the distance between the buildings.



45. A ship traveling at sea passes a marker known to be 1000 m from a lighthouse on a cliff as measured along the water. If the observation point at the top of the lighthouse is 96 m above the sea, what is the angle of depression from the lighthouse to the ship?



For questions 46 – 47, sketch each point in a coordinate plane. An angle θ is in the standard position with the given point P on its terminal side. Find $\sin \theta$, $\cos \theta$, and $\tan \theta$.

Trig #2 46. $P(3, 4)$

47. $P(-5, -12)$