# MIDTERM
# AND
# FINAL EXAMINATIONS
# AND
# ANSWERS

**ELEMENTARY & INTERMEDIATE ALGEBRA Name:**

**Midterm Exam, Chapters 1-7**

***For Exercises 1–3, simplify.***

1. $-36 \div 6 \cdot 2$ 1. _____

2. $-4^2 + 11 - 2(4 - 7)$ 2. _____

3. $\sqrt{46-30} + [(5-8) - 7]$ 3. _____

4. At the beginning of the month Karen had \$1800 in her checking account. She paid the following bills: rent \$675, utilities \$217.43, and credit card \$314.37. How much money did she have for food and other expenses? 4. _____

5. Translate into an algebraic expression: eleven is four less than five times a number, *n*. 5. _____

***For Exercises 6 and 7, solve and check.***

6. $6(x+3) = 5(x-1)$ 6. _____

7. $\frac{x}{2} - 1 = \frac{2}{3}x - 3$ 7. _____

8. Solve for the indicated letter: $A = \frac{a+b+c}{3}$; $c$ 8. _____

9. Solve and graph the inequality: 9.
$-(2x + 3) < 3(x + 1) + 9$


10. The monthly cost of a cellular phone is \$39 for the first 1000 minutes and \$0.35 for each additional minute. Find the monthly cost for 1200 minutes. 10. _____

11. Solve: $\frac{5}{7.5} = \frac{0.3}{x}$ 11. _____

12. Change $12\frac{1}{2}\%$ to a fraction and a decimal in simplest form. 12. _____

13. What percent is 181.25 out of 3625? 13. _____

14. The length of a pool is four feet less than four times its width. The perimeter of the pool is 202 feet. Find the dimensions of the pool. 14. _____

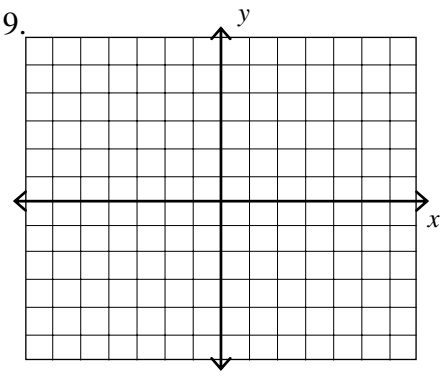
15. Mary has 30 coins in dimes and quarters with a combined value of \$5.70. Determine the number of coins of each type. 15. _____

16. Determine whether (–4, 5) is a solution for $y = -\frac{3}{4}x + 2$. 16. _____

17. Find the slope between (4, 2) and (–6, 8). 17. _____

18. Write the equation of a line in the form $Ax + By = C$ through the point (–6, 2) and parallel to the line $4x - 6y = 7$. 18. _____

19. Graph: $3x - 2y > -6$ 19.




20. Find the indicated value of the function: 20. _____

$f(x) = |x - 4|$

$f(-4) =$

21. Evaluate $-3x^2y^2 - 2xy^3$ when $x = -2$ and $y = -1$. 21. _____

22. Subtract: 22. _____

$5y - [3y - (5 - 4y - 3y^2)$

***For Exercises 23–25, perform the indicated operation.***

23. $(x + 3)(3x^2 - 4x + 5)]$ 23. _____

24. $(3x^{-2}y^3)^{-2}$ 24. _____

25. $\dfrac{2x^3 + x^2 - x + 10}{x + 2}$ 25. _____

***For Exercises 26–28, factor completely.***

26. $x^2 + 13x + 40$ 26. _____

27. $36x^2 - 16$ 27. _____

28. $x^3 - 8y^3$ 28. _____

29. Solve: $x^2 - 5x = -6$ 29. _____

30. The width of a rectangle is 2 feet more than twice the length. If the area is 40 square feet, find the width. 30. _____

***For Exercises 31–33, perform the indicated operation.***

31. $\dfrac{x^2 - 9}{27 - x^3}$ 31. _____

32. $\dfrac{4x^2y}{2z^2} \div \dfrac{20xy^4}{6x^2z^3}$ 32. _____

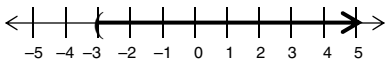
33. $\dfrac{a-4}{a^2+4a+3} - \dfrac{a-1}{a^2-9}$ 33. _____

34. Solve: $1 + \dfrac{1}{a-1} = \dfrac{8}{a^2-1}$ 34. _____

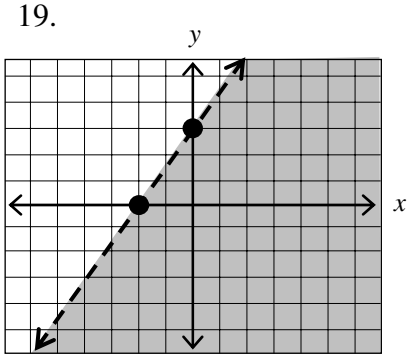
35. Joe can paint a fence in 5 hours. Ben can paint the same fence in 8 hours. How long will it take them to paint the fence if they work together? 35. _____

**Midterm Exam, Chapters 1-7**

1. $-12$
2. $1$
3. $-6$
4. \$593.20
5. $11 = 5n - 4$
6. $-23$
7. $12$
8. $c = 3A - a - b$
9. $x > -3$




10. \$109
11. 0.45
12. $\frac{1}{8}$, 0.125
13. 5%
14. 21 feet by 80 feet
15. 12 dimes, 18 quarters
16. Yes
17. $-\frac{3}{5}$
18. $2x - 3y = -18$
19.




20. 8
21. $-16$
22. $-3y^2 - 2y + 5$
23. $3x^3 + 5x^2 - 7x + 15$
24. $\frac{x^4}{9y^6}$
25. $2x^2 - 3x + 5$
26. $(x + 8)(x + 5)$
27. $4(3x + 2)(3x - 2)$
28. $(x - 2y)(x^2 + 2xy + 4y^2)$
29. 2, 3
30. 10 feet
31. $-\frac{x+3}{9+3x+x^2}$
32. $\frac{3x^3z}{5y^3}$
33. $\frac{13-7a}{(a+1)(a-3)(a+3)}$
34. $\frac{-1\pm\sqrt{33}}{2}$
35. $3\frac{1}{13}$ hours

**ELEMENTARY & INTERMEDIATE ALGEBRA Name:**

**Final Exam, Form A**

1. Simplify: $\sqrt{75-50} + [(3-9)+10]$ 1. _____

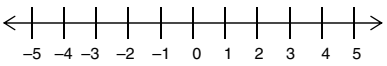
2. An airplane flew 1320 miles in 3 hours. What was its average speed? 2. _____

3. Translate into an algebraic expression: five is two more than three times a number $n$. 3. _____

4. Solve for $x$. $-3x - 8 = -2(x - 2)$ 4. _____

5. Solve for the indicated letter: $A = P + Prt$; $r$ 5. _____

6. Solve and graph the inequality: 6.
$8 - 2(x + 3) \leq 6(x - 1)$




7. Solve: $\frac{1.2}{0.9} = \frac{4.8}{y}$ 7. _____

8. What percent is 18 out of 45? 8. _____

9. The perimeter of a patio is 86 feet. The length is 7 feet more than three times the width of the patio. Find the width of the patio. 9. _____

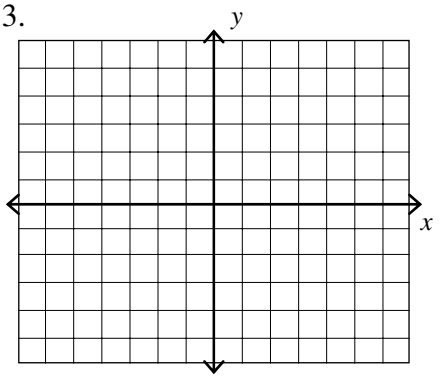
10. Amy has 24 coins in dimes and quarters with a combined value of \$4.05. Determine the number of coins of each type. 10. _____

11. Find the slope between (–3, 5) and (–5, –3). 11. _____

12. Write the equation of a line in the form $Ax + By = C$ through the point (1, –2) and perpendicular to the line 12. _____
$x - 2y = 4$.

13. Graph: $x - 2y > -6$

13.




14. Find the indicated value of the function:

$f(x) = |2x - 4|$

$f(-2) =$

14. _____

15. Subtract:

$3y - [5y - (7 + 2y - 4y^2)]$

15. _____

***For Exercises 16–18, perform the indicated operation.***

16. $(3x - 2)(2x^2 - 3x + 4)$

16. _____

17. $(2x^{-2}y^3)^{-3}$

17. _____

18. $\dfrac{6x^3 - 23x^2 + 24x - 10}{2x - 5}$

18. _____

***For Exercises 19 and 20, factor completely.***

19. $x^2 + 10x + 21$

19. _____

20. $16x^2 - 25$

20. _____

21. Solve for $x$. $x^2 + 8x = -15$

21. _____

22. The width of a rectangle is 2 feet less than twice the length. If the area is 40 square feet, find the width.

22. _____

***For Exercises 23–26, perform the indicated operation.***

23. $\dfrac{x^2 - 9}{6 + x - x^2}$

23. _____

24. $\dfrac{7x^4y^2}{10a^3b^2} \div \dfrac{35x^2y^5}{20a^2b^5}$ 24. _____

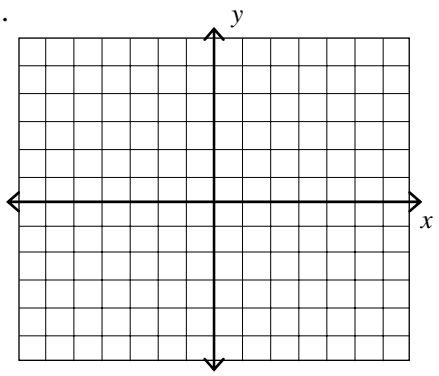
25. $\dfrac{2x}{x+1} + \dfrac{2x}{x^2-1}$ 25. _____

26. Solve: $\dfrac{1}{2} + \dfrac{1}{a+1} - \dfrac{1}{a} = 0$. 26. _____

27. Solve: $2|3-4x| = 10$. 27. _____

28. Solve: $|3x+1| \le 4$. 28. _____

29. Graph $f(x) = |x-2| + 3$ 29.




30. Given $f(x) = 4x+5$ and $g(x) = 3x-7$, find: 30. a)_____

a) $f - g$ b)_____

b) $f \cdot g$

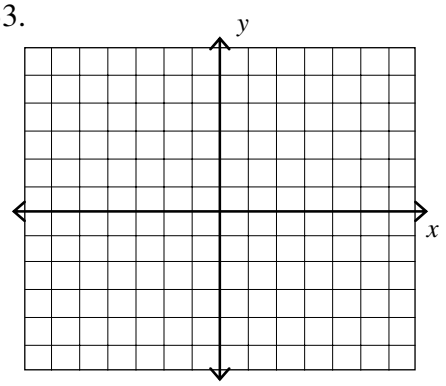
***For Exercises 31 and 32, solve the system of equations using substitution or elimination.***

31. $\begin{cases} x+2y=6 \\ 5x+3y=2 \end{cases}$ 31. _____

32. $\begin{cases} 4x+5y=-2 \\ 5x-3y=16 \end{cases}$ 32. _____

33. Graph the solution set for the system of inequalities. 33.

$$\begin{cases} 2x + y \geq 6 \\ x - 2y < 4 \end{cases}$$




34. A 30% solution is to be mixed with a 70% solution to get a 40 L mixture that is 60%. How much of each solution should be used? 34. _____

***For Exercises 35–38, perform the indicated operation.***

35. $\sqrt{500x^5y^2}$ 35. _____

36. $\sqrt{27} - \sqrt{12} + \sqrt{75}$ 36. _____

37. $\dfrac{5}{\sqrt{2}+\sqrt{3}}$ 37. _____

38. $\sqrt{-2x-4} = 2 + x$ 38. _____

39. Solve by completing the square: $x^2 + 2x - 5 = 0$ 39. _____

40. Solve by using the quadratic formula: $2x^2 + 3x = -2$ 40. _____

41. Solve: $2x^4 - 10x^2 + 8 = 0$ 41. _____

42. Solve $\dfrac{x-6}{x+4} \leq 0$. Write the answer in interval notation. 42. _____

43. If $f(x) = \dfrac{x+4}{6}$, find $f^{-1}(x)$. 43. _____

44. Solve $9^{x-2} = 243^{x+1}$ for $x$. 44. _____

45. Solve $e^{5-x} = 23$ for $x$. Approximate to four decimal places. 45. _____

46. If you invest \$2000 in an account with 8% interest compounded continuously, how much will it be worth in 10 years?

46. _____

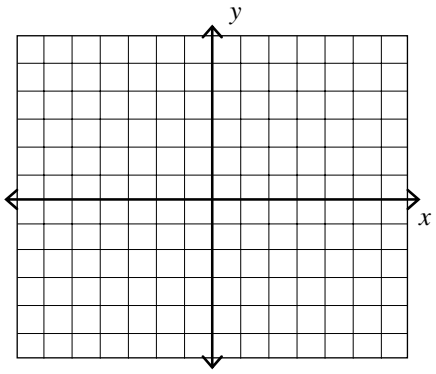
47. Find the direction the parabola opens, the coordinates of the vertex, and the equation of the axis of symmetry. Draw the graph.

$y = 3(x+2)^2 + 3$

47. a)_____

b)_____

c)_____




48. Find the distance between the points whose coordinates are (–2, –8) and (3, 4).

48. _____

49. Find the solution of the system of equations.

49. _____

$$\begin{cases} x^2 + y^2 = 9 \\ 9x^2 - 7y^2 = 81 \end{cases}$$

50. The sum of two numbers is 9. The sum of the squares of the two numbers is 221. Find the two numbers.

50. _____

**ELEMENTARY & INTERMEDIATE ALGEBRA Name:**

**Final Exam, Form B**

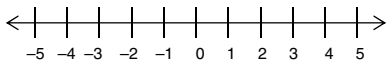
1. $-5^2 + 15 - 3(4 - 9)$ — 1. _____

2. At the beginning of the month Kelli had \$1600 in her checking account. She paid the following bills: rent \$575, utilities \$273.43, and credit card \$312.87. How much money did she have for food and other expenses? — 2. _____

3. Translate into an algebraic expression: nine is five less than twice a number $n$. — 3. _____

4. Solve for $x$. $2x - 7 = 3(x + 2) - 8$ — 4. _____

5. Solve for the indicated letter: $V = \frac{1}{3}Bh$; $h$ — 5. _____

6. Solve and graph the inequality: $4 + 6(x - 1) \le 2(2x + 3)$ — 6. 


7. Solve: $\frac{2}{0.4} = \frac{17.5}{y}$ — 7. _____

8. What percent is 60 out of 15? — 8. _____

9. A person invested \$35,000, part at 15% and the rest at 3% simple interest. If the total yearly interest from these investments was \$4290, how much was invested at each rate? — 9. _____

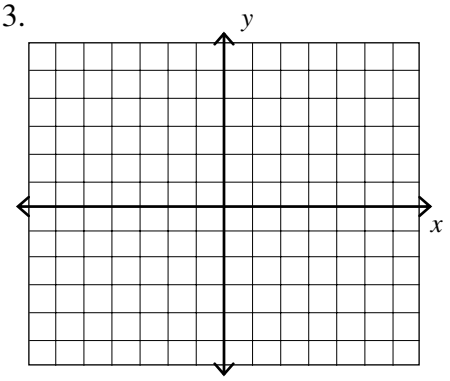
10. A kennel charges a flat fee of \$15 plus \$12 a day to board an animal. Nancy's bill came to \$111. How many days did her dog stay at the kennel? — 10. _____

11. Find the slope between (–3, 5) and (7, –1). — 11. _____

12. Write the equation of a line in the form $Ax + By = C$ through the point (–2, 3) and parallel to the line $2x - y = 4$. — 12. _____

13. Graph: $5x - 2y > -10$

13.




14. Find the indicated value of the function:
$f(x) = |3x^3 - 2x - 1|$
$f(-2) =$

14. _____

15. Subtract:
$4y - [5y - (6 + 4y - 3y^2)]$

15. _____

***For Exercises 16–18, perform the indicated operation.***

16. $(2x + 3)(3x^2 - 4x + 5)$

16. _____

17. $(3x^{-3}y^4)^{-2}$

17. _____

18. $\dfrac{4x^3 + 3x^2 + 3x - 4}{x + 2}$

18. _____

***For Exercises 19 and 20, factor completely.***

19. $8x^2 - 10x - 3$

19. _____

20. $x^3 - 27$

20. _____

21. Solve: $4x^2 + 20x = -25$

21. _____

22. The width of a rectangle is 5 feet more than twice the length. If the area is 75 square feet, find the width.

22. _____

***For Exercises 23–26, perform the indicated operation.***

23. $\dfrac{36 - x^2}{x^2 - 9x + 18}$

23. _____

24. $\dfrac{6x^4y^2}{15a^3b^2} \div \dfrac{2x^2y^5}{5a^2b^5}$ 24. _____

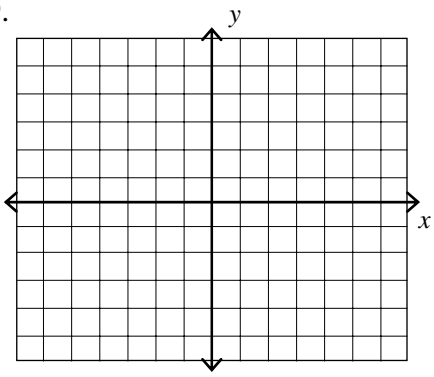
25. $\dfrac{a}{a+5} - \dfrac{50}{a^2-25}$ 25. _____

26. Solve: $\dfrac{5}{6} + \dfrac{2}{2a-1} - \dfrac{5}{6a-3} = 0$. 26. _____

27. Solve: $3|2x+3| = 21$. 27. _____

28. Solve: $|3-x| \geq 5$. 28. _____

29. Graph $f(x) = |x+3| - 2$ 29.




30. Given $f(x) = 4x-5$ and $g(x) = 3x-2$, find: 30. a)_____

a) $f-g$ b)_____

b) $f \cdot g$

***For Exercises 31 and 32, solve the system of equations using substitution or elimination.***

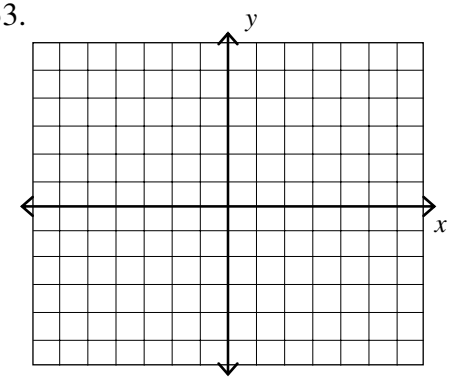
31. $\begin{cases} 4x-y=7 \\ 2x-y=3 \end{cases}$ 31. _____

32. $\begin{cases} 3x+4y=11 \\ 4x-3y=23 \end{cases}$ 32. _____

33. Graph the solution set for the system of inequalities.

$$\begin{cases} x + y \geq 3 \\ 2x - y < 6 \end{cases}$$

33.




34. A boat traveling with the current can go 60 miles in 3 hours. Traveling against the current, the boat takes 5 hours to go the same distance. Find the speed of the boat in still water.

34. _____

***For Exercises 35–38, perform the indicated operation.***

35. $\sqrt{48x^6y^5}$

35. _____

36. $\sqrt[3]{9x^2} \cdot \sqrt[3]{81x^5}$

36. _____

37. $\dfrac{\sqrt{3}}{\sqrt{15} - \sqrt{3}}$

37. _____

38. $2\sqrt{x+6} = 3 + x$

38. _____

39. Solve by completing the square: $2x^2 - 10x - 7 = 0$.

39. _____

40. Solve by using the quadratic formula: $2x^2 + x = 8$.

40. _____

41. Solve: $x^4 - 21x^2 + 100 = 0$.

41. _____

42. Solve $\dfrac{3x+6}{x-1} > 0$. Write the answer in interval notation.

42. _____

43. If $f(x) = \dfrac{x-5}{3}$, find $f^{-1}(x)$. 43. _____

44. Solve $2^{3-2x} = 16$ for $x$. 44. _____

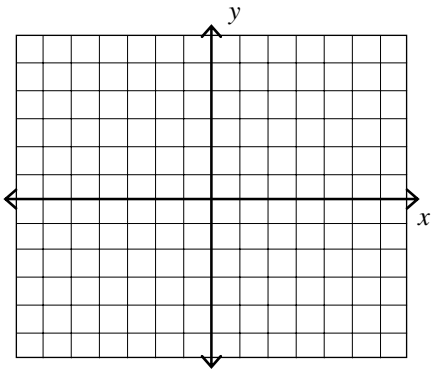
45. Solve $4e^{2x} = 5$ for $x$. Approximate to four decimal places. 45. _____

46. If you invest \$15,000 in an account with 4% compounded monthly, how much will it be worth in 3 years? 46. _____

47. Find the direction the parabola opens, the coordinates of the vertex, and the equation of the axis of symmetry. Draw the graph.

$y = x^2 + 2x - 3$

47. a)_____
b)_____
c)_____




48. Find the distance between the points whose coordinates are (–6, –2) and (–3, 4). 48. _____

49. Find the solution of the system of equations. 49. _____

$$\begin{cases} 4x^2 - 3y^2 = -32 \\ 3x^2 + 4y^2 = 76 \end{cases}$$

50. An oval track is elliptical in shape and has a length of 200 meters and a width of 160 meters. Write an equation of the track that has its center at the origin. 50. _____

**ELEMENTARY & INTERMEDIATE ALGEBRA Name:**

**Final Exam, Form C**

1. $|-18| - 2(9-3)^2 \div 9$ 1. _____

   (a) $-10$ (b) 10 (c) 26 (d) 64

2. The daily low temperatures for seven days were recorded as follows: $-5°, -8°, 6°, 8°, 0°, -6°, -2°$. What was the average low temperature for the seven day period? 2. _____

   (a) $-3°$ (b) $-1°$ (c) $0°$ (d) $1°$

3. Translate and simplify "nine times the sum of two consecutive numbers". 3. _____

   (a) $14n + 7$ (b) $14n + 14$ (c) $18n + 9$ (d) $18n + 18$

4. $3x - 4 = 5 + 3(2x + 1)$ 4. _____

   (a) $-4$ (b) 4 (c) $\frac{3}{4}$ (d) $\frac{4}{3}$

5. Solve for the indicated letter. $V = \frac{1}{3}Bh\,;\, h$ 5. _____

   (a) $\frac{3V}{B}$ (c) $3V - B$

   (b) $\frac{3B}{V}$ (d) $\frac{1}{3}V - B$

6. Solve: $2(5 - 3a) < 4 + 2a - 2$ 6. _____

   (a) $\{a \mid a > -1\}$ (b) $\{a \mid a < -1\}$ (c) $\{a \mid a > 1\}$ (d) $\{a \mid a < 1\}$

7. $\frac{14}{a} = \frac{35}{10}$ 7. _____

   (a) 4 (b) 8 (c) 240 (d) 490

8. 44.85 is what percent of 345? 8. _____

   (a) 12% (b) 13% (c) 15% (d) 23%

9. The sum of three consecutive integers is 48. Find the middle integer. 9. _____

   (a) 12 (b) 14 (c) 16 (d) 18

10. Two planes start at the same time and fly in opposite directions. One plane is flying 30 mph faster than the second plane. In 4 hours they are 2880 miles apart? Find the speed of the faster plane. 10. _____

(a) 300 mph (b) 315 mph (c) 345 mph (d) 375 mph

11. Find the coordinates for the $x$- and $y$-intercepts for $5x - 2y = -10$. 11. _____

(a) (0, 2) and (−2, 0) (c) (0, 5) and (2, 0)

(b) (0, −5) and (−2, 0) (d) (0, 5) and (–2, 0)

12. Find the slope of a line passing through the points (2, −1) and (–6, –3). 12. _____

(a) $-\frac{1}{4}$ (b) $\frac{1}{4}$ (c) 1 (d) 4

13. The points on the graph of $3x - 2y > 6$ lie 13. _____

(a) above the line $y = \frac{3}{2}x - 3$ (c) on or above the line $y = \frac{3}{2}x - 3$

(b) below the line $y = \frac{3}{2}x - 3$ (d) on or below the line $y = \frac{3}{2}x - 3$

14. Find the indicated value of the function $f(x) = 2x^2 - 3$. $f(-1) =$ 14. _____

(a) −5 (b) −1 (c) 1 (d) 7

15. Subtract $(-5x^3 + 4x)$ from $(11x^3 + 3x^2 - 2x)$. 15. _____

(a) $6x^3 + 3x^2 - 6x$ (c) $16x^3 + 3x^2 + 6x$

(b) $6x^3 + 3x^2 + 2x$ (d) $16x^3 + 3x^2 - 6x$

16. $(4x - 3)(x - 11)$ 16. _____

(a) $4x^2 - 47x + 33$ (c) $4x^2 - 15x - 33$

(b) $4x^2 - 15x + 33$ (d) $4x^2 - 47x - 33$

17. $(x^3y^{--2})^4$ 17. _____

(a) $\frac{y^8}{x^{12}}$ (b) $\frac{x^{12}}{y^8}$ (c) $x^7y^2$ (d) $x^{12}y^8$

18. $\dfrac{5a^3+18a^2+8a-3}{a+3}$ 18. _____

(a) $5a^2 - 3a - 1$ (c) $5a^2 + 3a - 1$

(b) $5a^2 - 3a + 1$ (d) $5a^2 + 3a + 1$

***For Exercises 19 and 20, factor completely.***

19. $m^2n + 6m^2 - 4n - 24$ 19. _____

(a) $(n - 6)(m^2 + 4)$ (c) $(n - 6)^2(m^2 - 4)$

(b) $(n + 6)(m^2 - 4)$ (d) $(m + 2)(m - 2)(n + 6)$

20. $5y^3 + 5y^2 - 10y$ 20. _____

(a) $y(5y + 5)(y - 2)$ (c) $5y(y + 2)(y - 1)$

(b) $y(5y - 10)(y + 1)$ (d) $5y(y^2 + y - 2)$

21. Solve: $4x^3 - 20x^2 = -25x$ 21. _____

(a) $0, -\dfrac{5}{2}$ (b) $0, \dfrac{5}{2}$ (c) $0, -\dfrac{2}{5}$ (d) $0, \dfrac{2}{5}$

22. The width of a rectangle is 7 feet longer than the length. If the area is 330 square feet, find the dimensions of the rectangle. 22. _____

(a) 11 feet by 30 feet (c) 15 feet by 22 feet

(b) 13 feet by 20 feet (d) 18 feet by 22 feet

***For Exercises 23–26, perform the indicated operation.***

23. $\dfrac{3x^2-27}{x^2-5x+6}$ 23. _____

(a) $\dfrac{x-3}{3(x-2)}$ (b) $\dfrac{3(x+9)}{x-3}$ (c) $\dfrac{3(x+3)}{x-2}$ (d) $\dfrac{3(x-2)}{x-3}$

24. $\dfrac{a-1}{a^2+1} \div \dfrac{a^2-1}{a+1}$ 24. _____

(a) $-1$ (b) $-\dfrac{1}{a^2+1}$ (c) $\dfrac{1}{a^2+1}$ (d) $\dfrac{a^3+1}{a^3-1}$

25. $\dfrac{7}{a^2-9}+\dfrac{2}{a+3}$ 25. _____

(a) $\dfrac{9}{a^2+a-6}$ (c) $\dfrac{2a+13}{(a+3)(a-3)}$

(b) $\dfrac{5}{(a+3)(a-3)}$ (d) $\dfrac{2a+1}{(a+3)(a-3)}$

26. $\dfrac{5}{y+1}=\dfrac{4}{y-3}$ 26. _____

(a) 3 (b) 7 (c) 11 (d) 19

27. Solve $|x+3|=5$ 27. _____

(a) –2, 2 (b) 2 (c) –2, 8 (d) –8, 2

28. Solve $|x-2|\le 6$. 28. _____

(a) $[-8, 4]$ (b) $[-4, 8]$ (c) $(-4, 8]$ (d) $(-4, 8)$

29. Solve $|x-1|+3\le 9$ 29. _____

(a) $[-5, 9]$ (c) $(-5, 7)$

(b) $(-\infty, -5]\cup[7, \infty)$ (d) $[-5, 7]$

30. Find f – g if $f(x)=x^2-3x+2$ and $g(x)=-2x^2-2x+1$ 30. _____

(a) $-x^2-x+1$ (c) $-x^2-5x+3$

(b) $3x^2-5x+3$ (d) $3x^2-x+1$

***For Exercises 31 and 32, solve the system of equations using substitution or elimination.***

31. $\begin{cases}2x-3y=1\\3x+2y=8\end{cases}$ 31. _____

(a) (2, 1) (b) (–9, 13) (c) (13, 9) (d) (1, 2)

32. $\begin{cases}3x-\ y=\ 5\\2x+3y=-4\end{cases}$ 32. _____

(a) (–1, –2) (b) (1,–2) (c) (1, 2) (d) (–2, 1)

33. The sum of two numbers is 29. Their difference is –1, find the two numbers. 33. _____

(a) 14 and 15 (b) 10 and 19 (c) 19 and 18 (d) 13 and 16

34. With the wind, a plane flies 420 miles in 3 hours. Against the wind the plane requires $5\frac{1}{4}$ hours to fly the same distance. Find the speed of the wind. 34. _____

(a) 30 mph (b) 34 mph (c) 40 mph (d) 110 mph

***For Exercises 35–38, perform the indicated operation.***

35. $\sqrt{12a^3b^2}\cdot\sqrt{3ab^3}$ 35. _____

(a) $6a^2b^2\sqrt{b}$ (b) $6a^4b^6$ (c) $36a^2b^3$ (d) $36a^4b^6$

36. $\left(\sqrt{7}+3\right)^2$ 36. _____

(a) $16+6\sqrt{7}$ (b) $58+9\sqrt{7}$ (c) 58 (d) $\sqrt{49}+9$

37. $\dfrac{3}{-2+\sqrt{3}}$ 37. _____

(a) $\dfrac{3\sqrt{3}-2}{7}$ (b) $\dfrac{\sqrt{9}-6}{7}$ (c) $\dfrac{\sqrt{9}-6}{9}$ (d) $-3\sqrt{3}-6$

38. $4-\sqrt{x+2}=3$ 38. _____

(a) –2 (b) –1 (c) 1 (d) No Solution

39. Solve by completing the square: $x^2-6x+2=0$ 39. _____

(a) $-3\pm\sqrt{7}$ (b) $-3\pm\sqrt{3}$ (c) $3\pm\sqrt{7}$ (d) $3\pm\sqrt{3}$

40. Solve by using the quadratic formula: $5x^2+3x=4$ 40. _____

(a) $\dfrac{-3\pm\sqrt{89}}{5}$ (c) $\dfrac{3\pm\sqrt{89}}{5}$

(b) $\dfrac{-3\pm\sqrt{89}}{10}$ (d) $\dfrac{3\pm\sqrt{89}}{10}$

41. Solve: $x-4x^{\frac{1}{2}}+3=0$. 41. _____

(a) 1, 9 (b) $9i$ (c) $\pm1,\pm9$ (d) –1, –9

42. Solve: $2x^2 + 5x \le -2$ 42. _____

(a) $\left(-2, \frac{1}{2}\right)$ (c) $\left[-2, -\frac{1}{2}\right]$

(b) $(-\infty, -2) \cup \left(\frac{1}{2}, \infty\right)$ (d) $\left(-\infty, 2\right] \cup \left[\frac{1}{2}, \infty\right)$

43. If $f(x) = -\frac{1}{4}x + 3$, find $f^{-1}(x)$. 43. _____

(a) $-4x - 12$ (b) $-x + 4$ (c) $4x - 3$ (d) $-4x + 12$

44. Solve $3 = 27^{2x-1}$ 44. _____

(a) $-\frac{2}{3}$ (b) $-3$ (c) $\frac{2}{3}$ (d) $-2$

45. Solve: $12^x = 16$. Round to the nearest hundredth. 45. _____

(a) 0.75 (b) 1.12 (c) 1.33 (d) 1.66

46. If you invest \$5000 in an account paying8% compounded quarterly, how much will it be worth in 5 years? 46. _____

(a) \$7346.64 (b) \$7429.74 (c) \$7459.12 (d) \$7529.74

47. Find the vertex of the graph of $f(x) = -7x^2 + 14x + 6$. 47. _____

(a) (–2, –50) (b) (–1, –15) (c) (1, 13) (d) (2, –8)

48. Find the distance between (–2, –7) and (4, –3). 48. _____

(a) 2 (b) 20 (c) $20\sqrt{5}$ (d) $2\sqrt{13}$

49. Solve the system of equations. 49. _____

$$\begin{cases} x^2 - 3y^2 = 1 \\ 4x^2 + 3y^2 = 19 \end{cases}$$

(a) (–1, –2), (–1, 2), (1, –2), (1, 2) (c) (–2, –1), (2, 1)

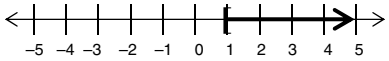
(b) (–2, –1), (–2, 1), (2, –1), (2, 1) (d) (–1, –2), (1, –2))

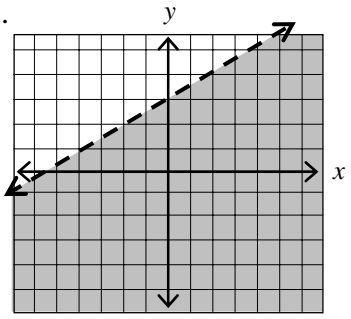
50. Find the center and radius of the circle. $x^2 + y^2 + 10x + 6y = -30$ 50. _____

(a) (–5, –3), 4 (b) (–5, –3), 2 (c) (5, 3), 4 (d) (5, 3), 2

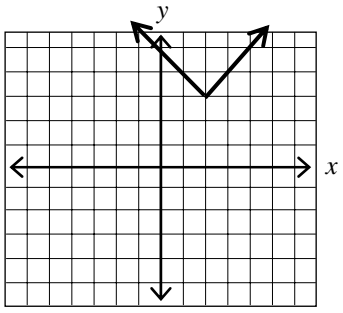
**Final Exam, Form A**

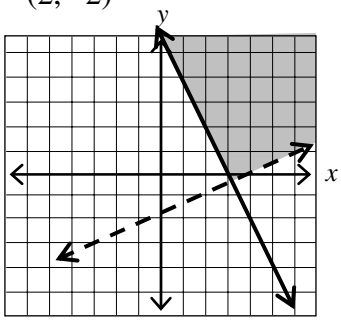
1. 9
2. 440 mph
3. $5 = 3n + 2$
4. –12
5. $r = \dfrac{A - P}{Pt}$
6. $x \geq 1$



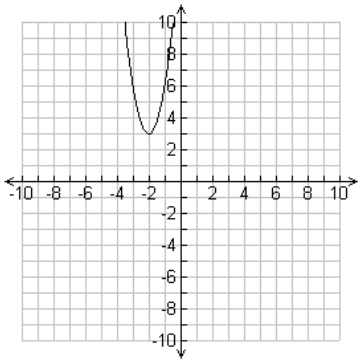

7. 3.6
8. 40%
9. 9 feet
10. 11 quarters, 13 dimes
11. 4
12. $2x + y = 0$
13. 

14. 8
15. $-4y^2 + 7$
16. $6x^3 - 13x^2 + 18x - 8$
17. $\dfrac{x^6}{8y^9}$
18. $3x^2 - 4x + 2$
19. $(x + 7)(x + 3)$
20. $(4x + 5)(4x - 5)$
21. –5, –3
22. 8 feet
23. $-\dfrac{x+3}{2+x}$
24. $\dfrac{2b^3x^2}{5ay^3}$
25. $\dfrac{2x^2}{(x+1)(x-1)}$
26. –2, 1
27. $-\dfrac{1}{2}, 2$
28. $\left[-\dfrac{5}{3}, 1\right]$
29. $y = |x - 2| + 3$




30. a) $x + 12$
    b) $12x^2 - 13x - 35$
31. (–2, 4)
32. (2, –2)
33. 

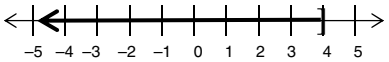
34. 10 L of 30%
    30 L of 70%
35. $10x^2y\sqrt{5x}$
36. $6\sqrt{3}$
37. $-5\sqrt{2} + 5\sqrt{3}$
38. –2
39. $-1 \pm \sqrt{6}$
40. $\dfrac{-3 \pm i\sqrt{7}}{4}$
41. $\pm 1, \pm 2$
42. (–4, 6]
43. $6x - 4$
44. –3
45. ≈ 1.8645
46. $4451.08
47. a) Upwards
    b) (–2, 3)
    c) $x = -2$
    $y = 3(x + 2)^2 + 3$

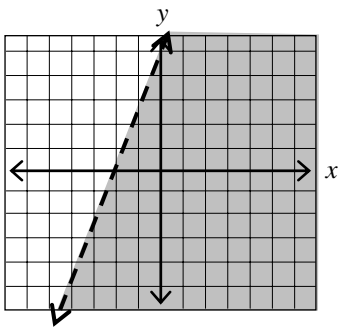



48. 13
49. (–3, 0), (3, 0)
50. –5 and 14

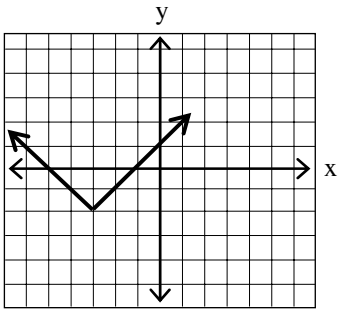
**Final Exam, Form B**

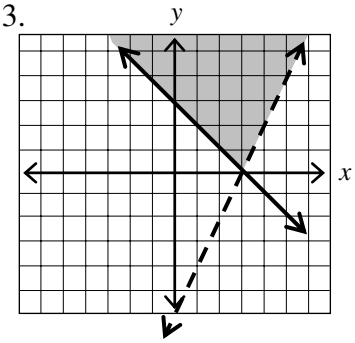
1. 5
2. $438.70
3. $9 = 2n - 5$
4. –5
5. $h = \dfrac{3V}{B}$
6. $x \le 4$



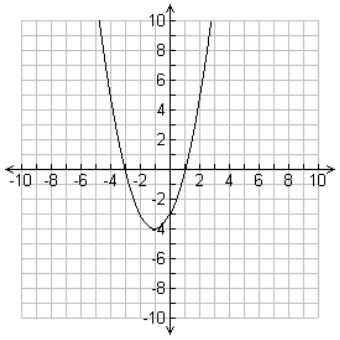

7. 3.5
8. 400%
9. $27,000 @ 15%
   $8000 @ 3%
10. 8 days
11. $-\dfrac{3}{5}$
12. $2x - y = -7$
13. 

14. 21
15. $-3y^2 + 3y + 6$
16. $6x^3 + x^2 - 2x + 15$
17. $\dfrac{x^6}{9y^8}$
18. $4x^2 - 5x + 13 - \dfrac{30}{x+2}$
19. $(4x + 1)(2x - 3)$
20. $(x - 3)(x^2 + 3x + 9)$
21. $-\dfrac{5}{2}$
22. 15 feet
23. $-\dfrac{6+x}{x-3}$
24. $\dfrac{b^3x^2y}{a}$
25. $\dfrac{a-10}{a-5}$
26. $\dfrac{3}{10}$
27. –5, 2
28. $(-\infty, -2] \cup [8, \infty)$
29. $y = |x + 3| - 2$




30. a) $x - 3$
    b) $12x^2 - 23x + 10$
31. (2, 1)
32. (5, –1)
33. 

34. 16 mph
35. $4x^3y^2\sqrt{3y}$
36. $9x^2\sqrt[3]{x}$
37. $\dfrac{1+\sqrt{5}}{4}$
38. 3
39. $\dfrac{5 \pm \sqrt{39}}{2}$
40. $\dfrac{-1 \pm \sqrt{65}}{4}$
41. $x = \pm 5, \pm 2i$
42. $(-\infty, -2) \cup (1, \infty)$
43. $3x + 5$
44. $-\dfrac{1}{2}$
45. $\approx 0.1116$
46. $16,909.08
47. a) Upwards
    b) (–1, –4)
    c) $x = -1$
    $y = x^2 + 2x - 3$




48. $3\sqrt{5}$
49. (2, 4), (2, –4),
    (–2, 4), (–2, –4)
50. $\dfrac{x^2}{10,000} + \dfrac{y^2}{6400} = 1$

**Final Exam, Form C**

| | | | | |
|---|---|---|---|---|
| 1. b | 11. d | 21. b | 31. a | 41. a |
| 2. b | 12. b | 22. c | 32. b | 42. c |
| 3. c | 13. b | 23. c | 33. a | 43. d |
| 4. a | 14. b | 24. c | 34. d | 44. c |
| 5. a | 15. d | 25. d | 35. a | 45. b |
| 6. c | 16. a | 26. d | 36. a | 46. b |
| 7. a | 17. b | 27. d | 37. d | 47. c |
| 8. b | 18. c | 28. b | 38. b | 48. d |
| 9. c | 19. d | 29. d | 39. c | 49. b |
| 10. d | 20. c | 30. d | 40. b | 50. b |