

MATH 51-130 Final Review Exercises Part 1

1. Evaluate $5v + 3w$ for $v = -5$ and $w = 2$.
- 31
 - 8
 - 3
 - 19

Simplify the expression.

2. $8(e - 1) + 2(e - 1)$
- | | |
|---------------|--------------|
| a. $10e - 10$ | c. $8e - 10$ |
| b. $8e - 6$ | d. $10e - 6$ |
3. $-3(w - 2) = 25 - 4w$
- | | |
|--------|-------|
| a. -31 | c. 31 |
| b. -19 | d. 19 |
4. Solve for n : $-5m - n = m + 7n$
- | | |
|-------------------------|--------------------------|
| a. $n = \frac{6m+n}{7}$ | c. $n = -\frac{4}{3}m$ |
| b. $n = -\frac{3}{4}m$ | d. $n = -\frac{n+5m}{5}$ |

Solve.

5. $-3x + 4 \leq 5x - 12$
- | | |
|----------------|----------------|
| a. $x = 16$ | c. $x \leq 16$ |
| b. $x \geq -2$ | d. $x \geq 2$ |

Solve the compound inequality.

6. $x + 3 < -2$ or $x - 7 > 0$
- $x > -5$ or $x < 7$
 - $-5 > x > 7$
 - $x < -5$ or $x > 7$
 - $-5 < x < 7$

Solve the absolute value equation.

7. $|6c + 5| = 4$
- | | |
|---------------------------------|--------------------------------|
| a. $-\frac{1}{6}, -\frac{3}{2}$ | c. $\frac{2}{3}, -\frac{2}{3}$ |
| b. $\frac{2}{3}, \frac{4}{3}$ | d. $-\frac{1}{6}, \frac{3}{2}$ |

Solve the absolute value inequality.

8. $|d+2| \geq 2$

- a. $d < -4$ or $d > 0$
- b. $d \leq -4$ or $d \geq 0$

- c. $-4 \leq d \leq 0$
- d. $-4 < d < 0$

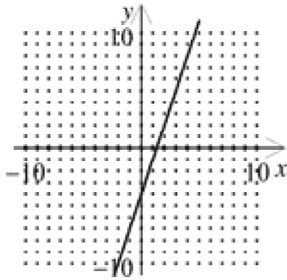
9. $|z-7| < 5$

- a. $z < 2$ or $z > 12$
- b. $2 \leq z \leq 12$

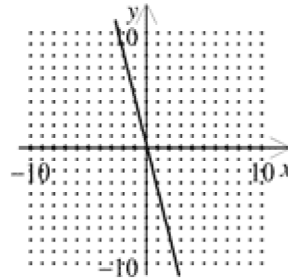
- c. $2 < z < 12$
- d. $z \leq 2$ or $z \geq 12$

10. Graph $f(x) = \frac{1}{3}x - 4$.

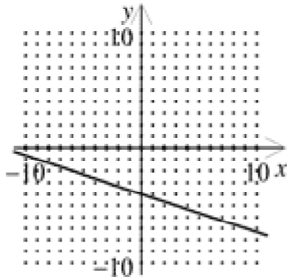
a.



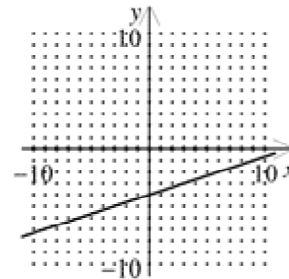
c.



b.



d.



11. Find the slope of the line passing through the points $(-7, -1)$ and $(-6, 5)$.

a. 6

c. $\frac{1}{6}$

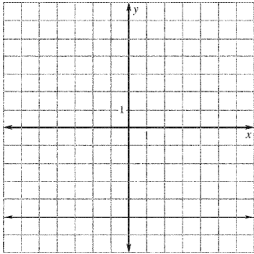
b. $-\frac{4}{13}$

d. $-\frac{13}{4}$

Graph the equation.

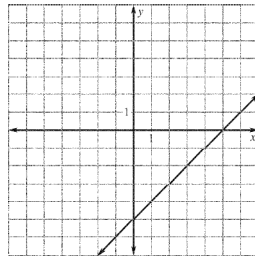
12. $x = -5$

a. none of these

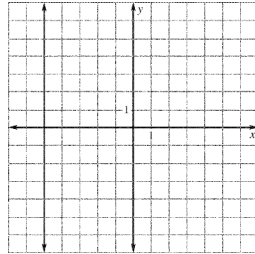


b.

c.



d.



13. Find the x - and y -intercepts of $y = -4x - 5$.

a. x -intercept: -4 ; y -intercept: -5

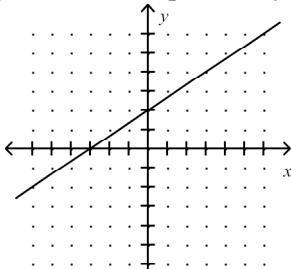
c. x -intercept: $-\frac{5}{4}$; y -intercept: -5

b. x -intercept: -5 ; y -intercept: -4

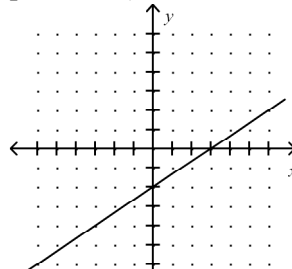
d. x -intercept: -5 ; y -intercept: $-\frac{5}{4}$

14. Graph the linear equation by finding x - and y -intercepts. $2x - 3y = -6$

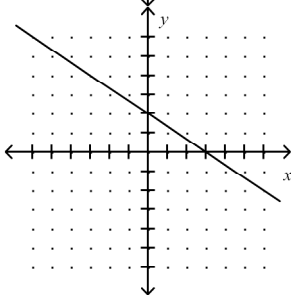
a.



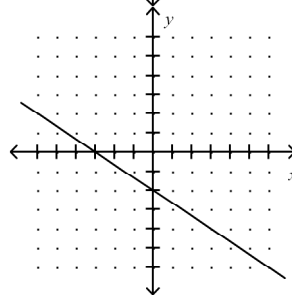
c.



b.

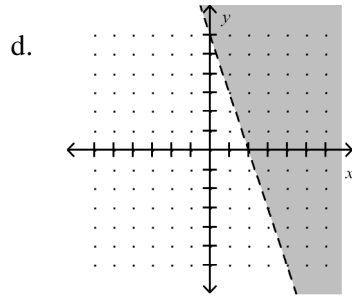
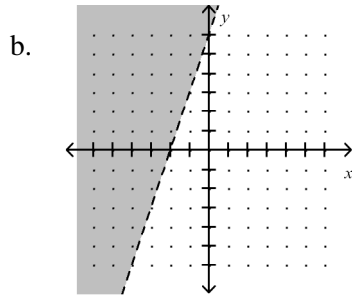
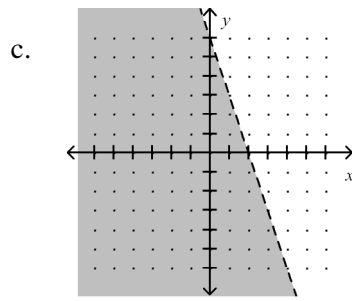
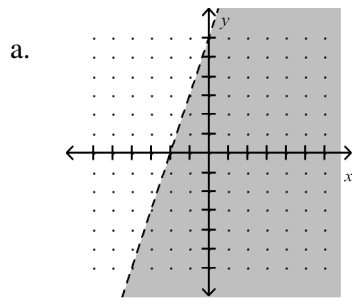


d.



Graph the inequality in a coordinate plane.

20. $6x - 2y < -12$



21. A rental car agency charges \$17 per day plus 7 cents per mile to rent a certain car. Another agency charges \$22 per day plus 5 cents per mile to rent the same car. How many miles per day will have to be driven for the cost of a car from the first agency to equal the cost of a car from the second agency?
- | | |
|-----------------------|-----------------------|
| a. 195 miles per day | c. 1950 miles per day |
| b. 2500 miles per day | d. 250 miles per day |

Solve the linear system.

22. $-3x - 4y = 8$
 $-2x - 2y = 6$

- | | |
|--------------|------------------------------|
| a. $(-4, 1)$ | d. no solution |
| b. $(-5, 5)$ | e. infinitely many solutions |
| c. $(-3, 2)$ | |

23. $-3x - 3y = -4$
 $y = -x + 1$

- | | |
|---------------|------------------------------|
| a. $(4, -4)$ | d. no solution |
| b. $(-5, -5)$ | e. infinitely many solutions |
| c. $(2, -5)$ | |

24. Mr. Frankel bought 5 tickets to a puppet show and spent \$22. He bought a combination of child tickets for \$2 each and adult tickets for \$8 each. Which system of equations below will determine the number of adult tickets, a , and the number of child tickets, c , he bought?

a. $8a + 2c = 22$
 $a + c = 5$

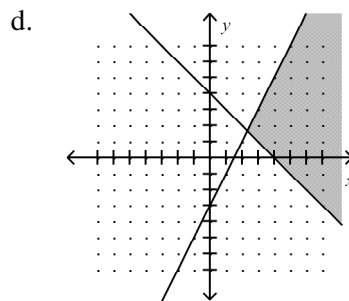
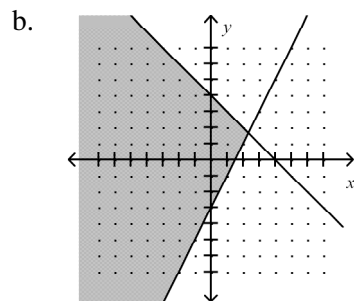
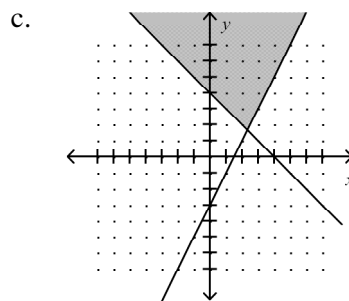
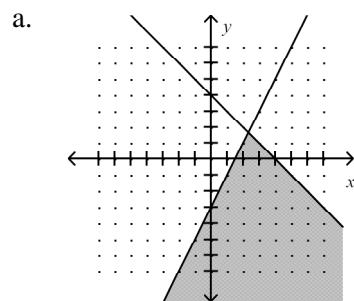
c. $2a + 2c = 27$
 $a + c = 5$

b. $a = c - 8$
 $8a + 2c = 22$

d. $a + c = 110$
 $a + c = 5$

Graph the system of inequalities.

25. $y \leq -x + 4$
 $y \geq 2x - 3$



Solve the system of equations for z only.

26. $x + y + z = -10$
 $-2x - y + z = 2$
 $x - 2y - z = 9$

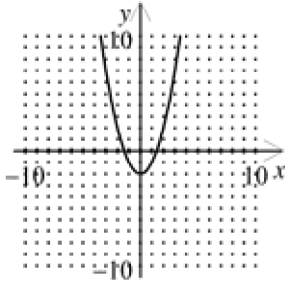
- a. 4
 b. -4

- c. -5
 d. 5

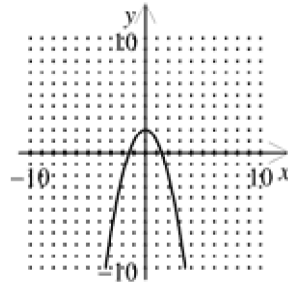
Graph.

27. $y = -x^2 - 2$

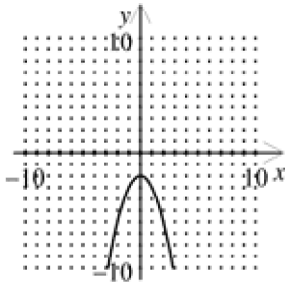
a.



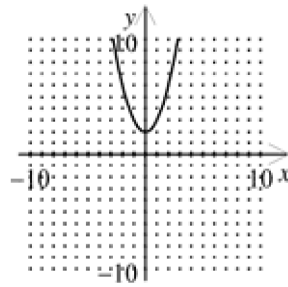
c.



b.



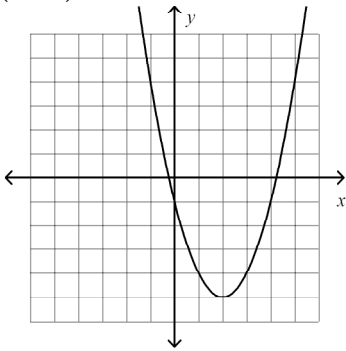
d.



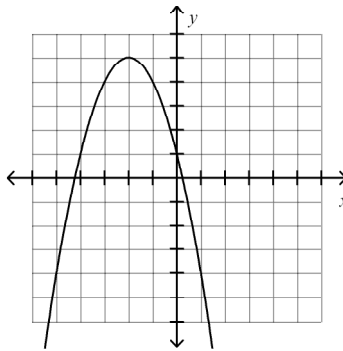
Graph.

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

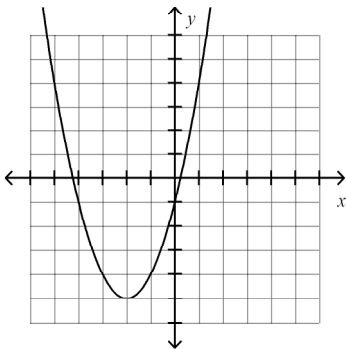
a.



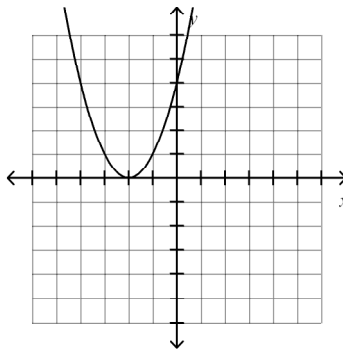
c.



b.

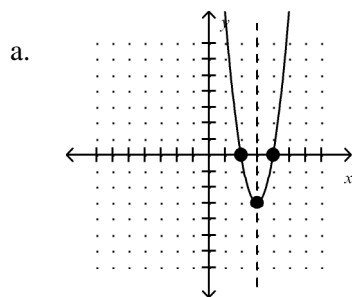


d.

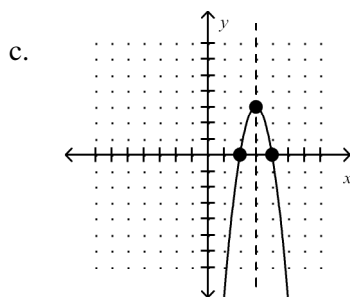


29. Graph the function. Label the vertex, axis of symmetry, and x -intercepts.

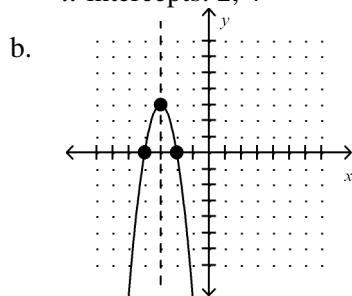
$$y = -3(x-4)(x-2)$$



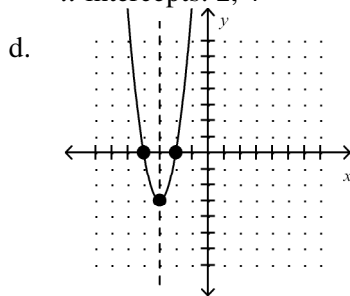
vertex: $(3, -3)$
axis of symm: $x = 3$
 x -intercepts: 2, 4



vertex: $(3, 3)$
axis of symm: $x = 3$
 x -intercepts: 2, 4



vertex: $(-3, 3)$
axis of symm: $x = -3$
 x -intercepts: $-4, -2$



vertex: $(-3, -3)$
axis of symm: $x = -3$
 x -intercepts: $-4, -2$

Write in standard form.

30. $y = -(x-2)^2 - 2$

a. $y = -x^2 - 4x + 6$

c. $y = -x^2 + 4x - 6$

b. $y = -x^2 + 4x + 6$

d. $y = -x^2 - 4x - 6$

31. Write as the product of two factors: $2x^2 + x - 15$

a. $(2x+5)(x-3)$

c. $(2x+3)(x-5)$

b. $(2x-5)(x+3)$

d. $(2x-3)(x+5)$

.

32. Name one factor of the expression: $14x^2 - 5x - 6$

a. $(2x-6)$

c. $(7x+6)$

b. $(2x+6)$

d. $(7x-6)$

33. Factor the expression: $16x^2 - 25$

- a. $(4x + 5)(4x - 5)$
- b. $(16x + 1)(x - 25)$

- c. $(4x - 5)(4x - 5)$
- d. $(16x - 1)(x + 25)$

Solve.

34. $x^2 - 9x = 0$

- a. $-9, 9$
- b. $0, 9$

- c. $0, -9$
- d. $1, 9$

35. $40x^2 - 76x + 28 = 0$

- a. $-\frac{1}{2}, \frac{7}{5}$
- b. $\frac{1}{2}, \frac{7}{5}$

- c. $\frac{4}{5}, \frac{7}{8}$
- d. $-\frac{4}{5}, \frac{7}{8}$

Factor completely.

36. $24u^5 + 66u^4 + 45u^3$

- a. $3u^3(2u + 5)(4u + 3)$
- b. $u^3(2u - 5)(4u + 3)$

- c. $u^3(4u + 5)(2u + 3)$
- d. $3u^3(4u + 5)(2u + 3)$

Simplify the expression.

37. $2\sqrt{605} \cdot \sqrt{55}$

- a. $18\sqrt{5}$
- b. $110\sqrt{11}$

- c. $115\sqrt{5}$
- d. $55\sqrt{11}$

38. $\frac{\sqrt{1050}}{\sqrt{1470}}$

- a. $\frac{\sqrt{35}}{7}$
- b. $\frac{5\sqrt{6}}{\sqrt{30}}$

- c. $\frac{30\sqrt{35}}{7}$
- d. $\frac{5\sqrt{42}}{7\sqrt{30}}$

Solve.

39. $4(x - 5)^2 + 28 = 112$

- a. $-84 \pm \sqrt{7}$
- b. $84 \pm \sqrt{7}$

- c. $5 \pm \sqrt{21}$
- d. $-5 \pm \sqrt{21}$

Write the expression as a complex number in standard form.

40. $(7 + 9i) - (-2 - 3i)$

- a. $5 + 12i$
- b. $9 + 12i$

- c. $9 - 12i$
- d. $5 - 12i$

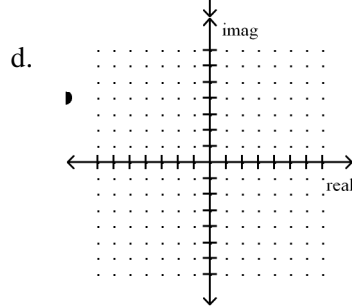
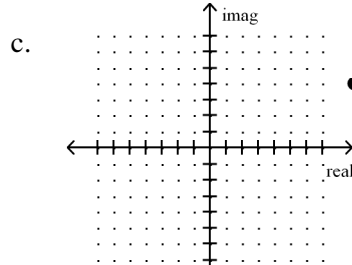
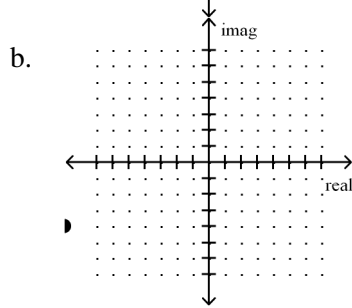
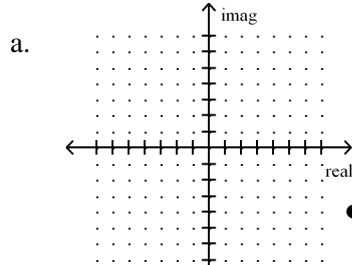
41. $\frac{4 - 5i}{4 - 6i}$

- a. $\frac{7}{10} - \frac{11}{5}i$
- b. $\frac{7}{10} + \frac{1}{5}i$

- c. $\frac{23}{26} - \frac{11}{13}i$
- d. $\frac{23}{26} + \frac{1}{13}i$

Plot the number in a complex plane.

42. $-9 + 4i$



Find the absolute value of the complex number.

43. $6 - 2i$

- a. 5.66
- b. 40

- c. 6.32
- d. 32

Solve.

44. $x^2 + 4x + 20 = 0$

- a. $2 + 8i, 2 - 8i$
- b. $2 + 4i, 2 - 4i$

- c. $-2 + 8i, -2 - 8i$
- d. $-2 + 4i, -2 - 4i$

What value should be added to both sides to complete the square.

45. $3c^2 - 12c = 6$

- a. 9
b. 4
c. 36
d. 16

Write the equation in vertex form: $y = a(x - h)^2 + k$.

46. $y = x^2 + 2x + 4$

- a. $y = (x + 1)^2 + 3$
b. $y = (x + 1)^2 + 4$
c. $y = (x - 1)^2 + 4$
d. $y = (x - 1)^2 + 3$

Find the maximum value of the quadratic equation.

47. $y = -3x^2 - 18x - 42$

- a. $\text{max} = -3$
b. $\text{max} = -63$
c. $\text{max} = -15$
d. $\text{max} = -42$

48. Use the quadratic formula to solve: $2x^2 - 7x - 1 = 0$

- a. $\frac{-7 + \sqrt{41}}{4}, \frac{-7 - \sqrt{41}}{4}$
b. $\frac{7 + \sqrt{41}}{4}, \frac{7 - \sqrt{41}}{4}$
c. $\frac{-7 + \sqrt{57}}{4}, \frac{-7 - \sqrt{57}}{4}$
d. $\frac{7 + \sqrt{57}}{4}, \frac{7 - \sqrt{57}}{4}$

Simplify the expression.

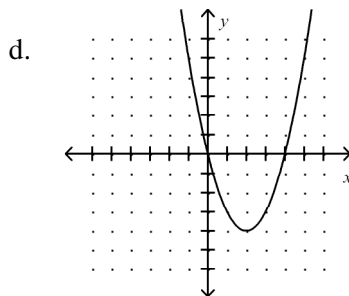
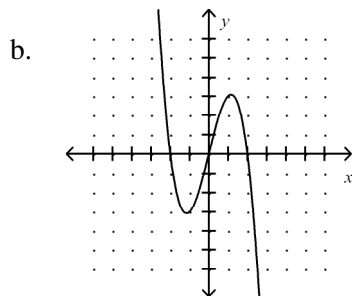
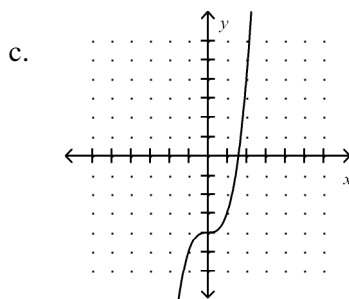
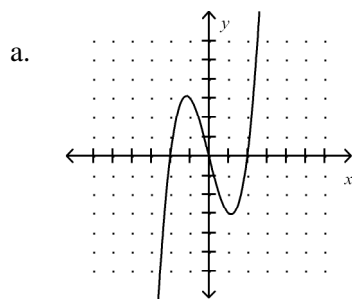
49. $(4a^5b^{-2})^{-3}$

- a. $\frac{b^6}{64a^{15}}$
b. $\frac{64b^6}{a^{15}}$
c. $4a^{-15}b^6$
d. $\frac{-12a^2}{b^5}$

50. $\left(\frac{t^2}{u^6}\right)^5$

- a. $\frac{t^7}{u^6}$
b. $\frac{t^{10}}{u^{30}}$
c. $\frac{t^7}{u^{11}}$
d. $\frac{t^{10}}{u^6}$

51. Which is the graph of the function $f(x) = x^3 - 4x$?



Find the sum or difference.

52. $(-2h^2 - 8h + 2) - (-9h^2 - 6h + 5)$

a. $7h^2 + 2h - 3$

c. $7h^2 - 2h - 3$

b. $7h^2 - 2h + 7$

d. $7h^2 - 14h + 7$

Find the product.

53. $(u - 2)(u^2 - 3u + 2)$

a. $u^3 - 3u^2 - 4$

c. $u^3 + u^2 + 8u - 4$

b. $u^3 - 5u^2 + 8u - 4$

d. $u^3 - 5u^2 - 4u - 4$

54. A rectangle has a length of $x - 2$ and a width of $x + 3$. Which equation below describes the perimeter, P , of the rectangle in terms of x ?

a. $P = x^2 + x - 6$

c. $P = x + 1$

b. $P = 2x + 1$

d. $P = 4x + 2$

Factor the polynomial completely.

55. $4a^3 - 12a^2 + 8a$

a. $a(4a^2 - 12a + 8)$

c. $4a(a^2 - 3a + 2)$

b. $4(a^3 - 3a^2 + 2a)$

d. $4a(a - 3)(a + 2)$

56. $125x^3 + 64$

a. $(5x - 4)(25x^2 + 20x + 16)$

c. $(5x + 4)(25x^2 - 20x + 16)$

b. $(5x + 4)(25x^2 + 20x + 16)$

d. $(5x + 4)^3$

Find the real-number solutions of the equation.

57. $v^3 + 2v^2 = 0$

a. $-2, 1$

c. $2, -2$

b. $0, 2$

d. $0, -2$

Divide.

58. $(-3x^3 + 4x - 9) \div (x - 3)$

a. $-3x^2 - 9x - 23 - \frac{78}{x-3}$

c. $-3x^2 - 9x + 31 - \frac{88}{x-3}$

b. $-3x^2 - 5x - 24 + \frac{72}{x-3}$

d. $-3x^2 - 5x + 15 + \frac{36}{x-3}$

59. $(2x^2 + 4x^3 - 4 - 10x) \div (2x + 3)$

a. $2x^2 + 2x + 2 + \frac{2}{2x+3}$

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

b. $2x^2 + 2x - 1 + \frac{1}{2x+3}$

d. $2x^2 - 2x + 1 + \frac{1}{2x+3}$

List the possible rational zeros of the function using the rational zeros theorem.

60. $g(x) = 2x^5 - 5x^3 + 13x + 15$

a. $\pm 1, \pm 2, \pm 3, \pm 5, \pm 15, \pm \frac{2}{3}, \pm \frac{2}{5}, \pm \frac{2}{7}$

c. $\pm 1, \pm 3, \pm 5, \pm 15, \pm \frac{1}{2}, \pm \frac{3}{2}, \pm \frac{5}{2}, \pm \frac{7}{2}$

b. $\pm 1, \pm 3, \pm 5, \pm 15$

d. $\pm 1, \pm 2, \pm 3, \pm 5, \pm 15$

Find all zeros of the polynomial function.

61. $f(x) = 2x^3 + 3x^2 - 8x + 3$

a. $3, \frac{1}{2}, -1$

c. $-3, 1, 3$

b. $-3, 1, -1$

d. $-3, \frac{1}{2}, 1$

62. Write a polynomial function that has the zeros 2, 3, and -2 and has a leading coefficient of 1.

a. $f(x) = x^3 - 3x^2 - 4x + 12$

c. $f(x) = x^2 + 2x - 3$

b. $f(x) = x^3 + 3x^2 + 4x + 12$

d. $f(x) = x^2 - 3x + 2$

63. Which is equivalent to $8^{-1/3}$?

a. 2

b. 4

c. $\frac{1}{2}$

d. $\frac{1}{4}$

Simplify:

64. $6\sqrt{2} - 2\sqrt{25} - 5\sqrt{32}$

a. $-\sqrt{59}$

c. $-14\sqrt{2} - 10$

b. $-24\sqrt{2}$

d. $-14\sqrt{2} - 10 - 5\sqrt{32}$

65. Let $f(x) = x^2 + 1$ and $g(x) = 2x^2$. Find $g(f(x))$.

a. $4x^4 + 1$

c. $2x^4 + 4x^2 + 2$

b. $2x^4 + 2$

d. $2x^4 + 1$

66. Which of the following is an equation for the inverse of the function $f(x) = 4x - 3$?

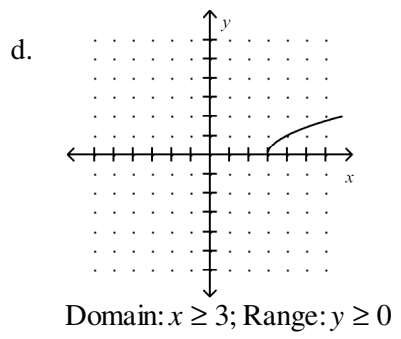
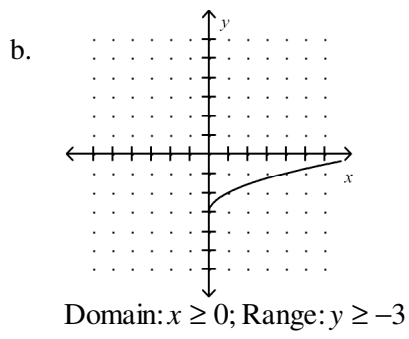
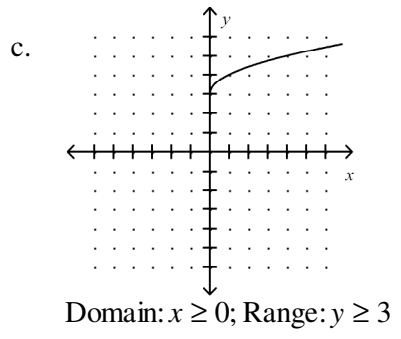
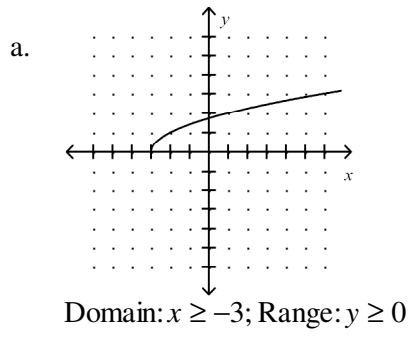
a. $f^{-1}(x) = \frac{1}{4}x + \frac{3}{4}$

c. $f^{-1}(x) = \frac{1}{4}x + \frac{1}{3}$

b. $f^{-1}(x) = \frac{1}{4}x - \frac{3}{4}$

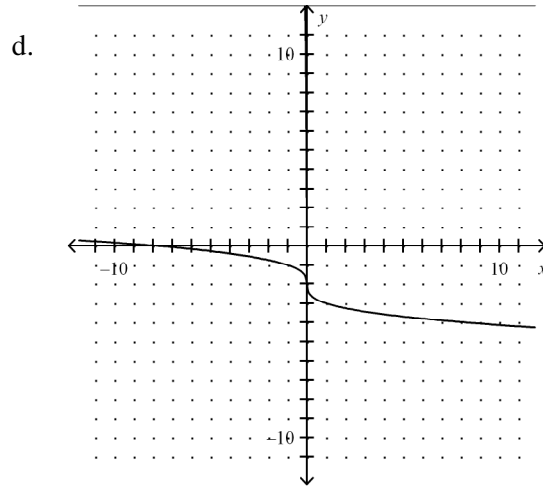
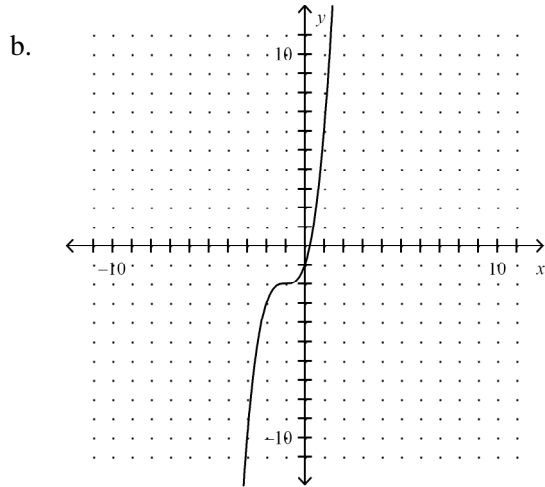
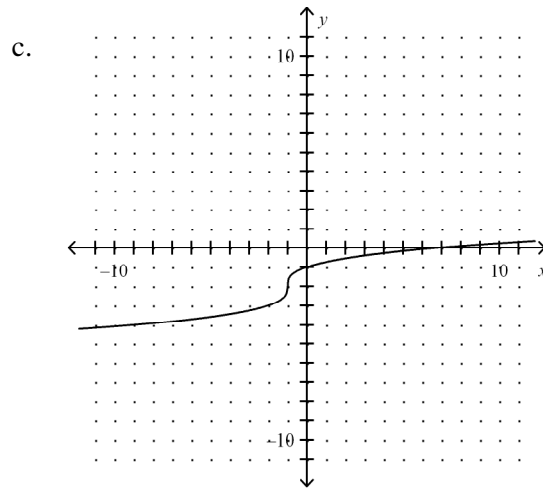
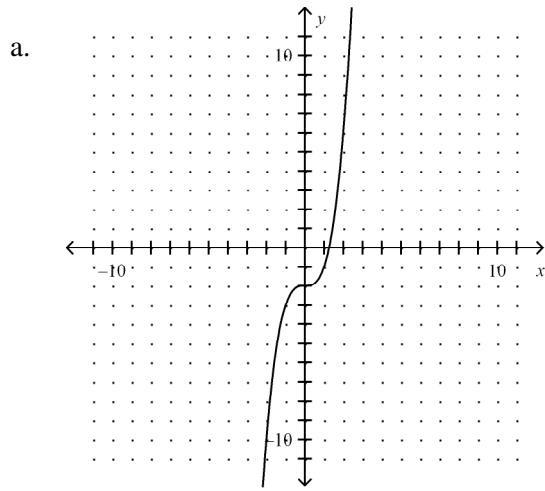
d. $f^{-1}(x) = \frac{1}{4}x - \frac{1}{3}$

67. Which represents the graph of $y = \sqrt{x+3}$? State the domain and range of the function.



Graph:

68. Which is the graph of $f(x) = \sqrt[3]{x+1} - 2$?



69. Which gives the solution(s) of $\sqrt{x+20} = x$?

- a. 5 b. 5, -4 c. no solution d. -4

70. Which gives the solution of $\sqrt[3]{5x-1} + 6 = 10$?

- a. 13 c. -13
b. $\frac{17}{5}$ d. none of these

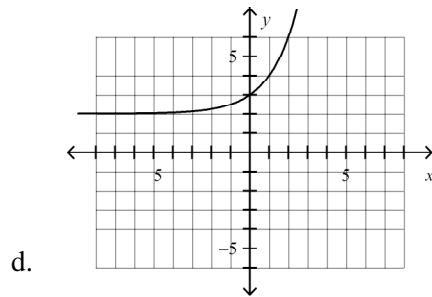
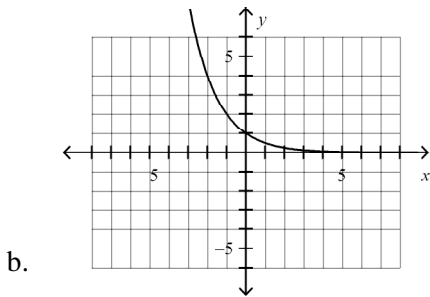
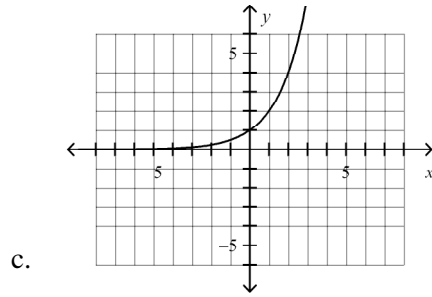
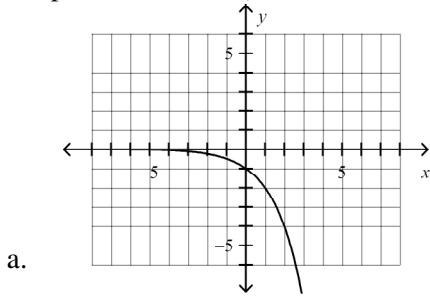
Answer Section

1. ANS: D
2. ANS: A
3. ANS: D
4. ANS: B
5. ANS: D
6. ANS: C
7. ANS: A
8. ANS: B
9. ANS: C
10. ANS: D
11. ANS: A
12. ANS: D
13. ANS: C
14. ANS: A
15. ANS: B
16. ANS: B
17. ANS: D
18. ANS: C
19. ANS: B
20. ANS: B
21. ANS: D
22. ANS: A
23. ANS: D
24. ANS: A
25. ANS: B
26. ANS: C
27. ANS: B
28. ANS: B
29. ANS: C
30. ANS: C
31. ANS: B
32. ANS: D
33. ANS: A
34. ANS: B
35. ANS: B
36. ANS: D
37. ANS: B
38. ANS: A
39. ANS: C
40. ANS: B
41. ANS: D
42. ANS: D

- 43. ANS: C
- 44. ANS: D
- 45. ANS: B
- 46. ANS: A
- 47. ANS: C
- 48. ANS: D
- 49. ANS: A
- 50. ANS: B
- 51. ANS: A
- 52. ANS: C
- 53. ANS: B
- 54. ANS: D
- 55. ANS: C
- 56. ANS: C
- 57. ANS: D
- 58. ANS: A
- 59. ANS: C
- 60. ANS: C
- 61. ANS: D
- 62. ANS: A
- 63. ANS: C
- 64. ANS: C
- 65. ANS: C
- 66. ANS: A
- 67. ANS: A
- 68. ANS: C
- 69. ANS: A
- 70. ANS: A

Math 51-130 Final Exam Review Exercises Part 2

_____ 1. Graph the function: $f(x) = 2^x$



_____ 2. Find the y-intercept of the equation. $y = 2 \cdot 4^x$

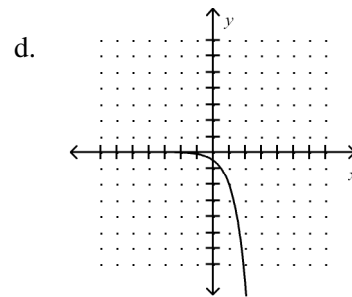
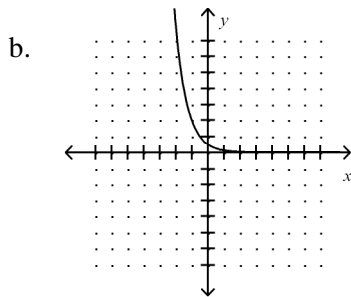
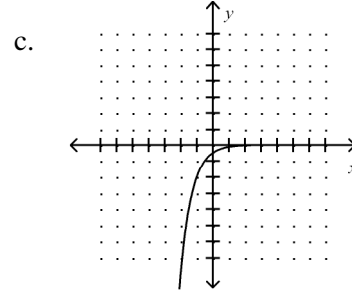
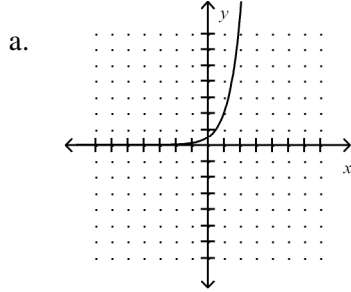
- a. 2 b. -2 c. 0 d. 8

_____ 3. The amount of money, A , accrued at the end of n years when a certain amount, P , is invested at a compound annual rate, r , is given by $A = P(1+r)^n$. If a person invests \$240 in an account that pays 6% interest compounded annually, find the balance after 5 years.

- a. \$321 b. \$2517 c. \$8400 d. \$1680

Graph:

— 4. $f(x) = \frac{1}{2} \left(\frac{1}{4} \right)^x$



Simplify:

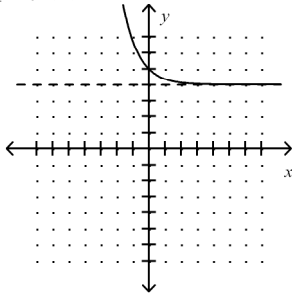
— 5. $\frac{18e^{18}}{4e^{13}}$

- a. $\frac{2}{9}e^{31}$
- b. $\frac{9}{2}e^{31}$

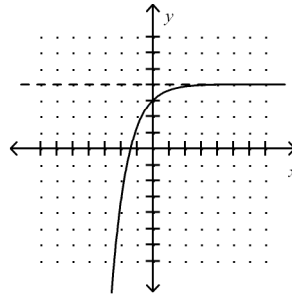
- c. $\frac{9}{2}e^5$
- d. $\frac{2}{9}e^5$

_____ 6. Graph $f(x) = 4 + e^x$.

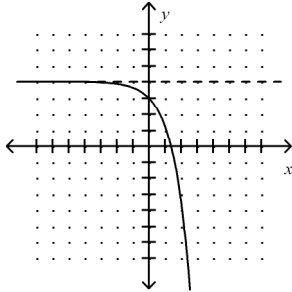
a.



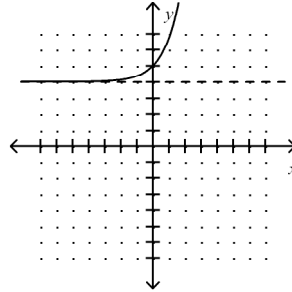
c.



b.



d.



_____ 7. If \$2000 is invested at a rate of 7% compounded continuously, find the balance in the account after 5 years.

Use the formula $A = Pe^{rt}$.

a. \$2805.10

b. \$2838.14

c. \$3043.92

d. \$14778.11

Evaluate:

_____ 8. $\log_2 8$

a. $\frac{1}{6}$

b. 3

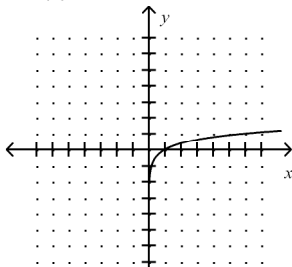
c. 6

d. $\frac{1}{3}$

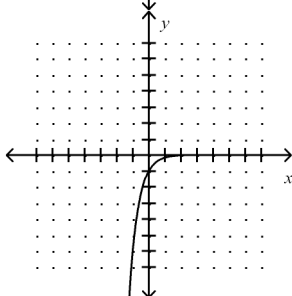
Graph:

9. $y = \log_{1/6} x$

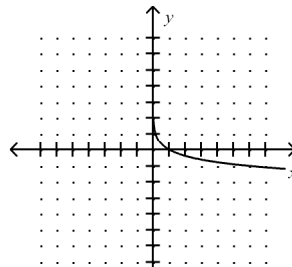
a.



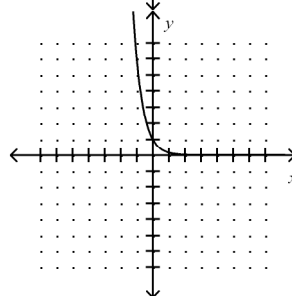
b.



c.



d.



10. Use the formula $R = \log_{10} I$, where R is the measurement of the Richter scale and I is the intensity, to find the Richter scale measurement of an earthquake with intensity 85,000,000.

- a. 0.79294 b. 7.9294 c. 1.82582 d. 18.2582

11. Express as a single logarithm: $\log_r 12 + \log_r 45$

- a. $\log_r 540$ c. $\log_r (12+45)$
 b. $\log_r \left(\frac{12}{45} \right)$ d. $\log_r 12^{45}$

Solve:

12. $\frac{1}{16} = 64^{3x+5}$

- a. $-\frac{7}{3}$ c. $-\frac{13}{9}$
 b. $-\frac{17}{9}$ d. $\frac{13}{9}$

13. Solve for x to the nearest hundredth: $1.95^x = 26$

- a. 1.41 b. 4.88 c. 0.29 d. 0.2

14. Solve. $e^{0.05t} = 10$

- a. none of these c. 9.5123
 b. 73.5759 d. 46.0517

Solve the equation. Check for extraneous solutions.

___ 15. $\log_2(5x + 1) = 4$

a. $\frac{7}{5}$

b. $\frac{3}{5}$

c. 3

d. $\frac{1}{5}$

___ 16. The number of bacteria present in a culture after t minutes is given as $B = 10e^{kt}$. If there are 593 bacteria present after 9 minutes, find k .

a. 0.454

b. 36.743

c. 0.442

d. 4.083

___ 17. Decide whether the data show inverse variation. If so, find the missing value.

2	0.1	0.5	20	5
4	20	10	1	0.4

a. yes; 2

b. yes; 0.75

c. yes; 1

d. not an inverse variation

___ 18. The wattage rating W (in watts) of an appliance varies jointly with the square of the current I (in amperes) and the resistance R (in ohms). If the wattage is 6 watts when the current is 0.2 ampere and the resistance is 150 ohms, find the wattage when the current is 0.3 ampere and the resistance is 300 ohms.

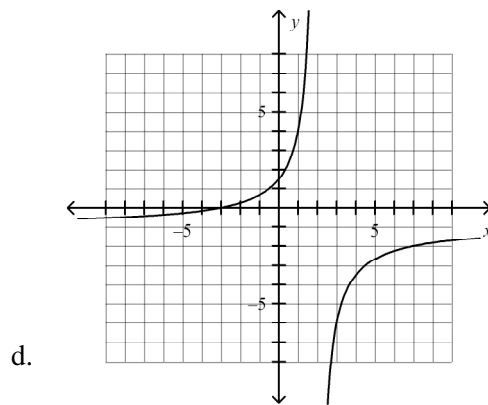
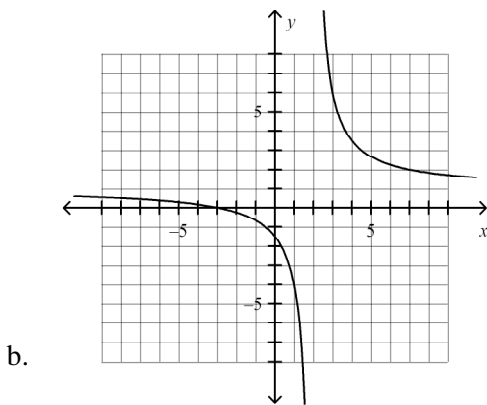
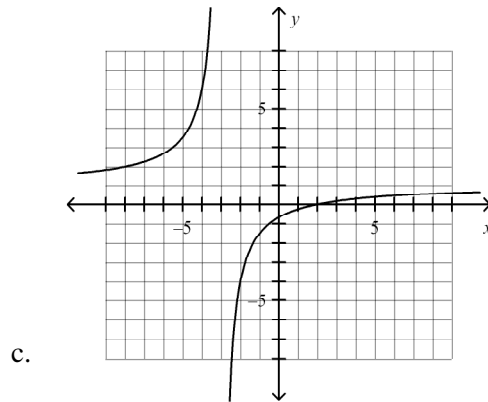
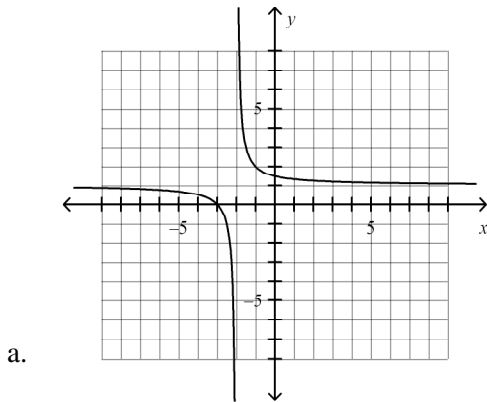
a. 180 watts

b. 27,000 watts

c. 27 watts

d. 90 watts

___ 19. Which is the graph of $f(x) = \frac{x+3}{x-2}$?



Simplify the rational expression, if possible.

___ 20. $\frac{x^2 - 2x - 15}{x^2 - x - 20}$

a. $\frac{x-3}{x-4}$

b. $\frac{x-3}{x+4}$

c. $\frac{x+3}{x-4}$

d. $\frac{x+3}{x+4}$

Multiply the expressions. Simplify the result.

___ 21. $\frac{6d^4}{3e^3f} \cdot \frac{15e^7f^2}{20d^9}$

a. $\frac{2e^4f}{3d^5}$

b. $\frac{3e^4f}{2d^5}$

c. $\frac{3d^5e^4f}{2}$

d. $\frac{3e^4f^2}{2d^5}$

_____ 22. $(x-5) \cdot \left(\frac{x+2}{x^2-25} \right)$

a. $\frac{x+2}{x-5}$

b. $\frac{x+2}{x+5}$

c. $\frac{x+2}{(x-5)(x^2-25)}$

d. $\frac{x-2}{x+5}$

_____ 23. $\frac{n^2-4}{n+2} \cdot \frac{6n^2}{2n-4}$

a. $3n$

b. $3n^2$

c. $\frac{3n(n-2)}{n-4}$

d. $\frac{n^2}{3}$

Divide the expressions. Simplify the result.

_____ 24. $\frac{x^2+9x+20}{x^2-25} \div \frac{x+4}{x-4}$

a. $\frac{9x+4}{5}$

b. $\frac{x-7}{x-5}$

c. $\frac{x-4}{x-5}$

d. $\frac{x+5}{x-4}$

Perform the indicated operation(s) and simplify.

_____ 25. $\frac{-2x-6}{9x} + \frac{x+6}{9x}$

a. $-\frac{x}{9}$

b. $\frac{-2x-x}{9x}$

c. $-\frac{1}{9}$

d. $-\frac{2}{9}$

_____ 26. $\frac{5}{x+4} + \frac{2}{x-4}$

a. $\frac{7}{x^2-16}$

b. $\frac{7x-12}{7}$

c. $\frac{7}{x+4}$

d. $\frac{7x-12}{x^2-16}$

Simplify the complex fraction.

_____ 27. $\frac{\frac{5}{x+5}}{\frac{1}{x}-6}$

a. $\frac{5x-29}{-6x}$

b. $\frac{5x}{-6x^2-29x+5}$

c. $\frac{5x}{-6x-29}$

d. $\frac{x}{5x-6}$

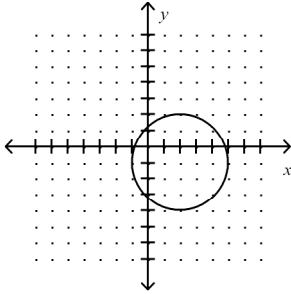
Solve the equation. Check for extraneous solutions.

- _____ 28. $\frac{2}{j-5} = j - 6$
a. 4, 7
b. 2
c. 1
d. 0
- _____ 29. $\frac{6}{v^2 - 4} = \frac{6}{v + 2}$
a. 2
b. 5
c. 3
d. 4
- _____ 30. $\frac{x^2}{x+9} = \frac{81}{x+9}$
a. 9
b. none of these
c. -9
d. -9, 9
- _____ 31. $\frac{x+1}{5x} - \frac{2}{4x} = \frac{1}{20}$
a. 3
b. 0
c. 1
d. 2
- _____ 32. $\frac{g}{g+1} + \frac{g}{g+9} = 1$
a. 9, -9
b. 4, -4
c. 3, -3
d. $\sqrt{3}, -\sqrt{3}$
- _____ 33. Find the distance between point A(9, 6) and point C(-7, 2), then find the midpoint of \overline{AC} .
a. distance = $4\sqrt{17}$
midpoint = (2, 8)
b. distance = $2\sqrt{10}$
midpoint = (2, 8)
c. distance = $4\sqrt{17}$
midpoint = (1, 4)
d. distance = $2\sqrt{10}$
midpoint = (1, 4)
- _____ 34. Find an equation of the perpendicular bisector of the segment connecting the points (-2, 3) and (-8, -1).
a. $y = \frac{3}{2}x + \frac{17}{2}$
b. $y = -\frac{2}{3}x + \frac{17}{2}$
c. $y = -\frac{3}{2}x - \frac{13}{2}$
d. $y = \frac{2}{3}x + \frac{13}{3}$
- _____ 35. Find the focus of the parabola: $y^2 = 32x$
a. (-8, 0)
b. (0, -8)
c. (8, 0)
d. (0, 8)
- _____ 36. Write the standard form of the equation of the parabola with its vertex at (0, 0) and focus at (5, 0).
a. $x = 5y^2$
b. $y^2 = 20x$
c. $x^2 = 20y$
d. $y^2 = \frac{1}{5}x$

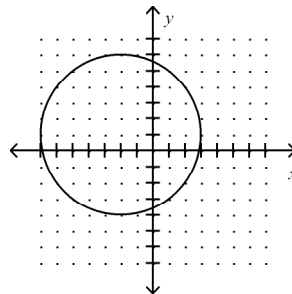
Graph:

_____ 37. $x^2 + y^2 = 25$

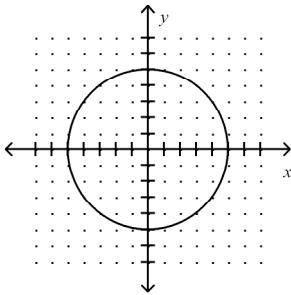
a.



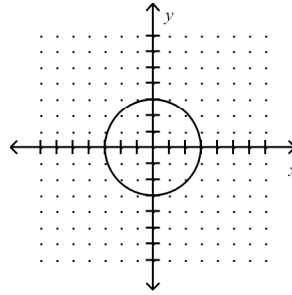
c.



b.



d.



_____ 38. Write the standard form of the equation of the circle with radius 4 and center at (0, 0).

a. $x^2 + y^2 = 16$

c. $\frac{x^2}{8} + \frac{y^2}{8} = 1$

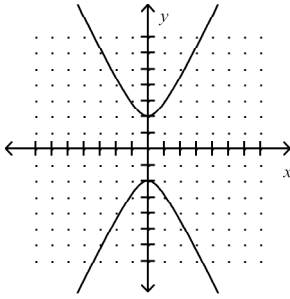
b. $x^2 + y^2 = 4$

d. $x^2 + y^2 = 8$

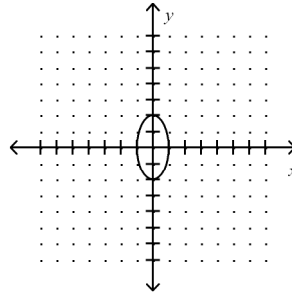
Graph:

39. $x^2 + 4y^2 = 4$

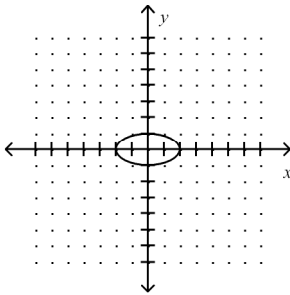
a.



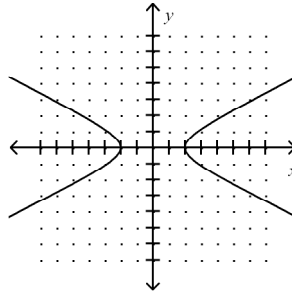
c.



b.

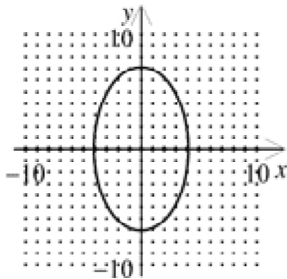


d.

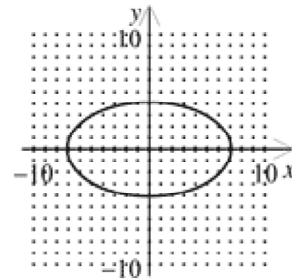


40. Write an equation of an ellipse with vertices of $(-7, 0)$ and $(7, 0)$, and co-vertices $(0, -4)$ and $(0, 4)$. Graph the ellipse.

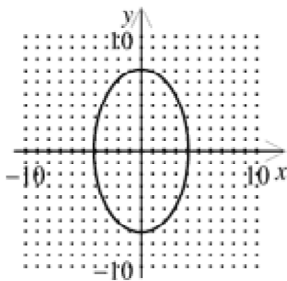
a. $\frac{x^2}{16} + \frac{y^2}{49} = 1$



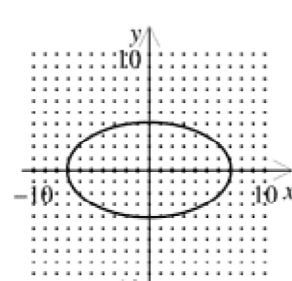
c. $\frac{x^2}{49} + \frac{y^2}{16} = 1$



b. $\frac{x^2}{4} + \frac{y^2}{7} = 1$



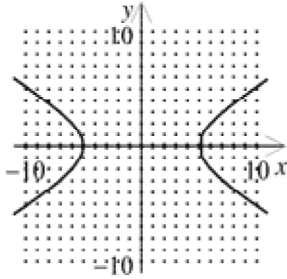
d. $\frac{x^2}{7} + \frac{y^2}{4} = 1$



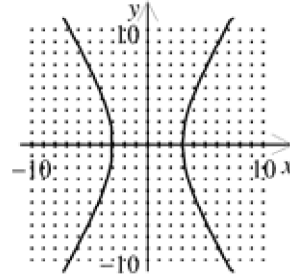
Graph:

___ 41. $\frac{x^2}{25} - \frac{y^2}{9} = 1$

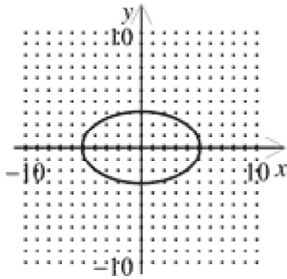
a.



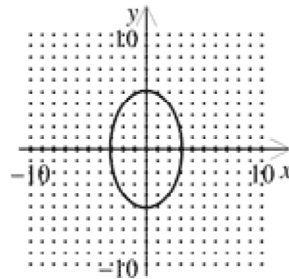
c.



b.



d.



___ 42. Find the center and radius of $x^2 + y^2 - 4x + 4y - 17 = 0$.

a. center $(-2, 2)$; $r = 5$

c. center $(2, -2)$; $r = 25$

b. center $(-2, 2)$; $r = 25$

d. center $(2, -2)$; $r = 5$

___ 43. Write an equation in standard form for the ellipse with foci $(3, 0)$ and $(-3, 0)$ and y-intercepts of 2 and -2 .

a. $\frac{x^2}{13} + \frac{y^2}{4} = 1$

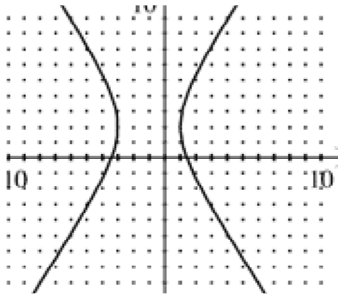
c. $\frac{x^2}{13} + \frac{y^2}{4} = 3$

b. $\frac{x^2}{4} + \frac{y^2}{13} = 3$

d. $\frac{x^2}{4} + \frac{y^2}{13} = 1$

Which equation represents the graph below?

44.



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

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

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

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

45. Write the equation of the parabola in standard form. $x^2 - 6x - 12y - 51 = 0$

a. $(y+5)^2 = 12(x-3)$

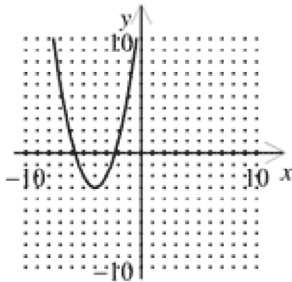
b. $(y+5)^2 = 12x - 36$

c. $(x-3)^2 = 12y + 60$

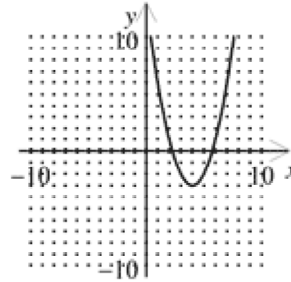
d. $(x-3)^2 = 12(y+5)$

46. Sketch the graph of $y+3 = (x+4)^2$.

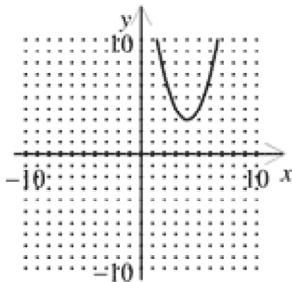
a.



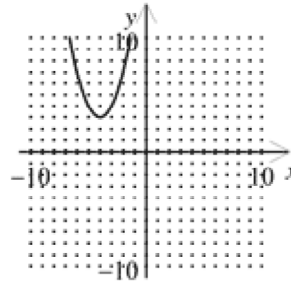
c.



b.

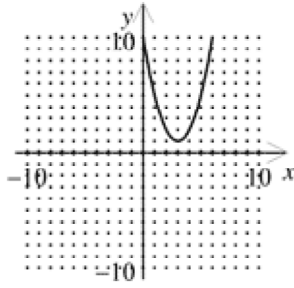


d.



Write an equation for the graph.

___ 47.



- a. $y - 1 = (x + 3)^2$ c. $y + 1 = (x + 3)^2$
 b. $y + 1 = (x - 3)^2$ d. $y - 1 = (x - 3)^2$

___ 48. Classify the conic section as a circle, an ellipse, a hyperbola, or a parabola.

$$x^2 = 4 - y^2$$

- a. parabola c. circle
 b. ellipse d. hyperbola

___ 49. A lunch menu consists of 6 different kinds of sandwiches, 3 different kinds of soup, and 4 different drinks. How many choices are there for ordering a sandwich, a bowl of soup, and a drink?

- a. 72 b. 3 c. 103,680 d. 13

Evaluate the factorial expression.

___ 50. $\frac{9!}{1! \cdot 2!}$

- a. 181,440 b. 362,880 c. 0 d. 2

___ 51. Eleven people are entered in a race. If there are no ties, in how many ways can the first three places come out?

- a. 4 b. 990 c. 1980 d. 1022

___ 52. Find the number of distinguishable permutations of the letters SOPHOMORES.

- a. 302,400 b. 3,628,800 c. 30,240 d. 5,040

___ 53. You own 7 sweaters and are taking 2 on vacation. In how many ways can you choose 2 sweaters from the 7?

- a. 14 b. 21 c. 42 d. 5040

___ 54. A committee is to consist of four members. If there are six men and four women available to serve on the committee, how many different committees can be formed?

- a. 252 b. 5040 c. 96 d. 210

- _____ 55. Expand $(3p - 4q)^4$.
- $81p^4 - 108p^3q + 144p^2q^2 - 192pq^3 + 256q^4$
 - $81p^4 - 432p^3q + 864p^2q^2 - 768pq^3 + 256q^4$
 - $3p^4 - 4q^4$
 - $81p^4 + 256q^4$
- _____ 56. Eight balls numbered from 1 to 8 are placed in an urn. If one ball is selected at random, find the probability that it is not number 1.
- $\frac{7}{8}$
 - $\frac{3}{4}$
 - $\frac{1}{8}$
 - $\frac{1}{2}$
- _____ 57. A number cube is rolled 400 times and the results recorded as follows: there were 63 ones, 68 twos, 57 threes, 66 fours, 65 fives, and 81 sixes. What is the experimental probability of rolling an even number?
- 0.36
 - 0.54
 - 0.46
 - 0.64
- _____ 58. Two cards are randomly selected from a standard 52-card deck. What is the probability of getting 2 hearts or 2 numbers less than 10 (count aces as 1)?
- 0.534
 - 0.003
 - 0.507
 - 0.423
- _____ 59. Two urns each contain blue balls and green balls. Urn I contains five blue balls and three green balls and Urn II contains four blue balls and five green balls. A ball is drawn from each urn at random. What is the probability that both balls are blue?
- $\frac{5}{24}$
 - $\frac{1}{8}$
 - $\frac{1}{9}$
 - $\frac{5}{18}$
- _____ 60. A coin is tossed and a die is rolled. What is the probability that the coin shows heads and the die shows 2?
- $\frac{1}{2}$
 - $\frac{1}{12}$
 - $\frac{1}{3}$
 - $\frac{1}{6}$
- _____ 61. A bag contains 5 red marbles and 3 purple marbles. One marble is drawn at random and not replaced. Then a second marble is drawn at random. What is the probability that the first marble is purple and the second one is red?
- $\frac{3}{4}$
 - $\frac{15}{56}$
 - $\frac{4}{3}$
 - $\frac{15}{64}$

- ___ 62. Which of these pairs of events are independent?
- You remove a blue glove from a drawer without looking, then remove another blue glove.
 - You reach into a basket and draw a name for a prize, return the name into the basket, and then draw a second time for another prize.
 - Your CD player has a random mode that chooses songs randomly and plays each song once before repeating. While listening to the CD player in random mode, you hear track 5 first and then hear track 3 second.
 - You choose a member of the basketball team to be the center. You choose a different member to be a forward.
- ___ 63. Find the median of the set of numbers.
5, 37, 28, 17, 42, 18, 27, 1, 33
- 27
 - 23.1
 - 41
 - 30.4
- ___ 64. Find the mode of the set of data.
16, 14, 10, 19, 14, 10, 16, 19, 10, 17
- 11
 - 14.5
 - 10
 - 15
- ___ 65. Five fathers were asked how many months old their babies were when they cut their first tooth. The results are shown below.
5, 8, 10, 6, 9
- Find the standard deviation of the data set.
- 3.44
 - 7.6
 - 17.2
 - 1.85
- ___ 66. Find the first four terms of the sequence $a_n = n(2n+4)$.
- 2, 10, 14, 18
 - 6, 16, 30, 48
 - 6, 16, 34, 56
 - 2, 12, 22, 36
- ___ 67. The number of lilies a large nursery can sell each day after April 1 is modeled by a sequence whose general term is $a_n = 1700 - 85n$, where n is the number of days after April 1. Find the number of lilies that can be sold on April 7th, 8th, and 9th.
- 1105, 1020, 935
 - 1190, 1105, 1020
 - 1020, 1105, 1020
 - 1275, 1190, 1105

Write a rule for the n th term of the arithmetic sequence.

- ___ 68. $-22, -19, -16, -13, \dots$
- $a_n = -25(3)^j$
 - $a_n = -25 + 3$
 - $a_n = 3n - 25$
 - $a_n = 3n - 16$
- ___ 69. Find the sum of the first 18 terms of the arithmetic sequence, if the first term is -2 and the common difference is 6.
- 882
 - 1764
 - 900
 - 588

- ___ 70. Find the common difference of the arithmetic sequence.
 $-2.8, -3.5, -4.2, -4.9, \dots$
 a. 0.7 b. -0.7 c. -0.8 d. 0.8
- ___ 71. Give the first four terms of the geometric sequence for which $a_1 = -5$ and $r = -5$.
 a. $-5, -10, -15, -20$ c. $25, -125, 625, -3125$
 b. $-5, 25, -125, 625$ d. $1, -\frac{1}{5}, \frac{1}{25}, -\frac{1}{125}$

Evaluate.

- ___ 72. $\sum_{j=1}^5 \left(\frac{1}{3}\right)^j$
 a. $\frac{121}{243}$ b. $\frac{121}{3}$ c. $\frac{40}{81}$ d. $\frac{121}{81}$
- ___ 73. Find the sum of the infinite geometric series $\sum_{k=1}^{\infty} 4\left(\frac{1}{2}\right)^{k-1}$.
 a. 8 c. -3
 b. -2 d. $\frac{7}{2}$

Find the sum of the infinite geometric series.

- ___ 74. $-12 - 3 - \frac{3}{4} - \dots$
 a. -8 c. -16
 b. -32 d. -64
- ___ 75. Write a recursive rule for the sequence.
 $540, -180, 60, -20, \dots$
 a. $t_1 = 540; t_n = -3(t_{n-1})$ c. $t_1 = -20; t_n = -\frac{1}{3}(t_{n-1})$
 b. $t_1 = -20; t_n = -3(t_{n-1})$ d. $t_1 = 540; t_n = -\frac{1}{3}(t_{n-1})$

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Answer Section

1. ANS: C
2. ANS: A
3. ANS: A
4. ANS: B
5. ANS: C
6. ANS: D
7. ANS: B
8. ANS: B
9. ANS: C
10. ANS: B
11. ANS: A
12. ANS: B
13. ANS: B
14. ANS: D
15. ANS: C
16. ANS: A
17. ANS: A
18. ANS: C
19. ANS: B
20. ANS: D
21. ANS: B
22. ANS: B
23. ANS: B
24. ANS: C
25. ANS: C
26. ANS: D
27. ANS: B
28. ANS: A
29. ANS: C
30. ANS: A
31. ANS: D
32. ANS: C
33. ANS: C
34. ANS: C
35. ANS: C
36. ANS: B
37. ANS: B
38. ANS: A
39. ANS: B
40. ANS: C
41. ANS: A
42. ANS: D

43. ANS: A
44. ANS: B
45. ANS: D
46. ANS: A
47. ANS: D
48. ANS: C
49. ANS: A
50. ANS: A
51. ANS: B
52. ANS: A
53. ANS: B
54. ANS: D
55. ANS: B
56. ANS: A
57. ANS: B
58. ANS: C
59. ANS: D
60. ANS: B
61. ANS: B
62. ANS: B
63. ANS: A
64. ANS: C
65. ANS: D
66. ANS: B
67. ANS: B
68. ANS: C
69. ANS: A
70. ANS: B
71. ANS: B
72. ANS: A
73. ANS: A
74. ANS: C
75. ANS: D