MAT 1033 Intermediate Algebra
Final Review

1. Solve for x: $2\left[x-2\left(5+2x\right)\right]=5\left(x-15\right)$

   [a] $x=5$

   [b] $x=11$

   [c] $x=-\frac{5}{11}$

   [d] $x=-5$

2. Which one of the following is a factor of: $6x^2+13x-5$

   [a] $\left(3x+1\right)$

   [b] $\left(2x-5\right)$

   [c] $\left(2x-1\right)$

   [d] $\left(3x-1\right)$

3. John bought a sweater on sale for 30% off the original price. If he saved \$80, what was the original price?

   [a] \$267

   [b] \$24

   [c] \$182

   [d] \$188

4. Solve for x: $\frac{3}{8}=4x+5$

   [a] $x=-\frac{37}{32}$

   [b] $x=-4$

   [c] $x=-\frac{37}{8}$

   [d] $x=-\frac{37}{4}$

5. A rectangle with an area of $80cm^2$ has a width that is three more than one half its length. What is the width of the rectangle?

   [a] $10cm$

   [b] $5cm$

   [c] $8cm$

   [d] $4cm$

6. Solve for x: $2x^2 - x = 15$

   [a] $x = \frac{5}{2}$ or $x = -3$

   [b] $x = \frac{5}{2}$ or $x = 3$

   [c] $x = -\frac{5}{2}$ or $x = 3$

   [d] There are no real solutions

7. Determine which of the following is a solution to the system of equations:

$$x + 5y = 18$$
$$y = 2x - 3$$

   [a] $x = 3$

   [b] $x = -3$

   [c] $y = -3$

   [d] inconsistent system (no solution)

8. Simplify: $\sqrt{\frac{32x^7y^6}{2xyz^2}}$

   [a] $\frac{8x^3y^2\sqrt{y}}{\sqrt{z}}$

   [b] $\frac{4x^3y^2\sqrt{y}}{\sqrt{z}}$

   [c] $\frac{4x^3y^2\sqrt{y}}{z}$

   [d] $\frac{8x^3y^2\sqrt{y}}{z}$

9. Simplify and write without negative exponents: $\dfrac{-5x^{\frac{1}{2}}y^{-\frac{1}{3}}}{30x^{\frac{1}{4}}y^{\frac{1}{3}}}$

[a] $\dfrac{-x^{\frac{1}{4}}}{6y^{\frac{4}{3}}}$

[b] $\dfrac{-x^{\frac{3}{4}}}{6y^{\frac{2}{3}}}$

[c] $\dfrac{-x^{\frac{1}{4}}}{6y^{\frac{2}{3}}}$

[d] $\dfrac{-x^{\frac{3}{4}}}{6y^{\frac{4}{3}}}$

10. Simplify the complex fraction: $\dfrac{\dfrac{x+8}{5}}{\dfrac{x-8}{x}}$

[a] $\dfrac{x(x-8)}{5(x+8)}$

[b] $\dfrac{5(x+8)}{x(x-8)}$

[c] $\dfrac{x(x+8)}{5(x-8)}$

[d] $\dfrac{5(x-8)}{x(x+8)}$

11. Solve using any method: $6x^2-11x-10=0$

[a] $x=\dfrac{5}{2},-\dfrac{2}{3}$

[b] $x=\dfrac{1\pm 2\sqrt{11}}{4}$

[c] $x=-\dfrac{5}{2},\dfrac{2}{3}$

[d] $x=\dfrac{2\pm 3i}{4}$

12. Simplify (write in lowest terms): $\dfrac{x^2-7x+12}{x^2-16}$

[a] $\dfrac{x-3}{x+4}$

[b] $\dfrac{x+3}{x-4}$

[c] $\dfrac{x-3}{x-4}$

[d] $\dfrac{3}{4}$

13. Simplify: $\sqrt{32x^3y}-x\sqrt{18xy}$

[a] $-5x\sqrt{xy}$

[b] $x\sqrt{2xy}$

[c] $-x\sqrt{2xy}$

[d] $4x\sqrt{2xy}-3\sqrt{2xy}$

14. Solve for Q: $\dfrac{PQ-W}{3}=R$

[a] $Q=\dfrac{R+3W}{3P}$

[b] $Q=\dfrac{3R+W}{P}$

[c] $Q=\dfrac{W-3R}{P}$

[d] $Q=\dfrac{\frac{1}{3}R+W}{P}$

15. Solve for x: $\dfrac{5}{x+5}-\dfrac{3}{x-5}=\dfrac{10}{x^2-25}$

[a] $x=25$

[b] $x=5$

[c] $x=-20$

[d] There are no solutions

16. Simplify: $\sqrt[4]{\frac{32t^6}{u^4v^8}}$

[a] $2tuv^2\sqrt[4]{2t^2}$

[b] $\frac{2t\sqrt[4]{2t^2}}{uv^2}$

[c] $\frac{2t\sqrt[4]{2t^2}}{\sqrt{uv^2}}$

[d] $\frac{2t\sqrt[4]{2t^2u}}{v}$

17. Add: $\frac{3}{x^2+xy}+\frac{7}{xy+y^2}$

[a] $\frac{7x+3y}{xy(x+y)}$

[b] $\frac{3y-7x}{xy(x+y)}$

[c] $\frac{10xy}{xy(x+y)}$

[d] $\frac{10}{(x+y)}$

18. Identify the domain of the function: $f(x)=\frac{x-5}{2x+3}$

[a] $x=$ all real numbers except $-\frac{2}{3}$

[b] $x=$ all real numbers except $-\frac{2}{3}$ and 5

[c] $x=$ all real numbers except $-\frac{3}{2}$ and 5

[d] $x=$ all real numbers except $-\frac{3}{2}$

19. Identify the range of the function: $f(x)=(x+2)^2$

[a] all real numbers

[b] $y \geq 0$

[c] $y \geq -2$

[d] $y \leq 0$

20. Write the equation for the line passing through the point $(4,-2)$ with a slope of $\frac{1}{3}$.

[a] $x+3y=10$

[b] $x-3y=-10$

[c] $x-3y=10$

[d] $x+3y=-10$

21. Write with positive exponents: $\left(\frac{3xy^{-4}}{2x^0y^2}\right)^{-3}$

[a] $\frac{8y^{18}}{27}$

[b] $\frac{-8y^{18}}{27x^3}$

[c] $\frac{3y^{18}}{2x^3}$

[d] $\frac{8y^{18}}{27x^3}$

22. Solve: $-3<\frac{3}{4}x+2\leq 5$

[a] $\frac{1}{3}<x\leq -\frac{7}{3}$

[b] $-\frac{7}{3}<x<\frac{1}{3}$

[c] $-\frac{20}{3}\geq x>4$

[d] $-\frac{20}{3}<x\leq 4$

23. Write the equation for the line passing through points $(-2,3)$ and $(1,4)$.

[a] $y=\frac{1}{3}x+\frac{11}{3}$

[b] $y=-\frac{1}{3}x+\frac{11}{3}$

[c] $y=\frac{1}{3}x-\frac{11}{3}$

[d] $y=-\frac{1}{3}x-\frac{11}{3}$

24. Write the equation for the line that is *parallel* to $3x-2y=5$ and passes through point $(0,3)$.

[a] $y=\frac{3}{2}x$

[b] $y=-\frac{2}{3}x+3$

[c] $y=\frac{3}{2}x+3$

[d] $y=-\frac{2}{3}x$

25. Solve: $\frac{x}{3x+6}+\frac{3}{x}=0$

[a] $\{-6,3\}$

[b] $\{3,6\}$

[c] $\{-6,-3\}$

[d] $\{-3,6\}$

26. Write the equation for the line that is *perpendicular* to $y=-\frac{1}{3}x-1$ and passes through point $(5,1)$.

[a] $3x+y=14$

[b] $3x+y=16$

[c] $x-3y=2$

[d] $3x-y=14$

27. Solve for x: $\sqrt{x+1}-1=x$

[a] $x=-1,0$

[b] $x=-1$

[c] $x=0,1$

[d] There are no solutions

28. Simplify: $\dfrac{x-2}{3x-6}+\dfrac{x-1}{x^2-4}$

[a] $\dfrac{3x}{3\left(x^2-4\right)}$

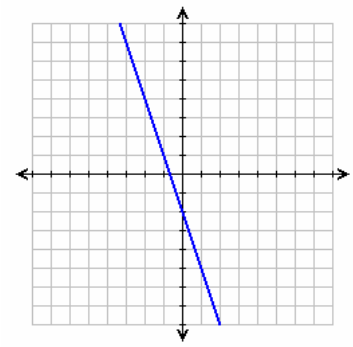
[b] $\dfrac{x^2+3x-7}{3(x+2)}$

[c] $\dfrac{x^2+3x-7}{3\left(x^2-4\right)}$

[d] $\dfrac{x^2+x-5}{x^2-4}$

29. Choose the correct graph for: $9x+3y=6$

[a]



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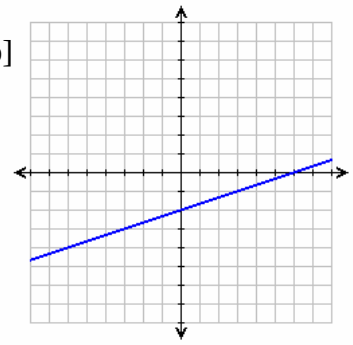

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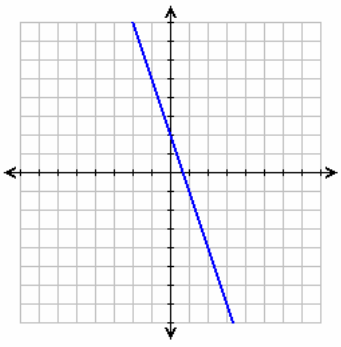

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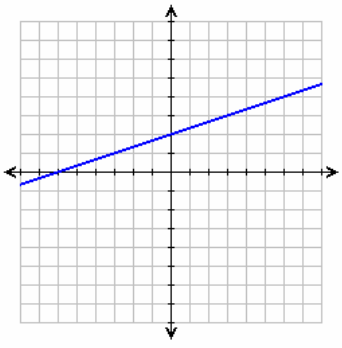


30. Solve: $\frac{4}{7}(x+4) > \frac{1}{7}(x+4)$

[a] $x < -4$

[b] $x < 4$

[c] $x > 4$

[d] $x > -4$

31. Given $f(x) = 2x^2 - 3x + 4$, find $f(2)$.

[a] $f(2) = -2$

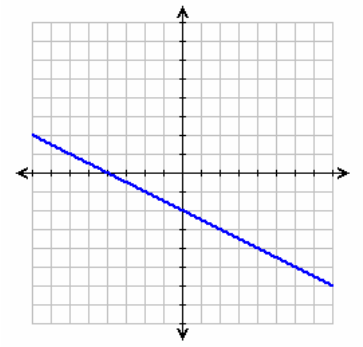
[b] $f(2) = 2$

[c] $f(2) = 6$

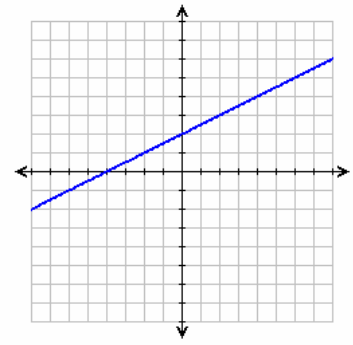
[d] $f(2) = 5$

32. Choose the correct graph for: $y = \frac{1}{2}x + 2$

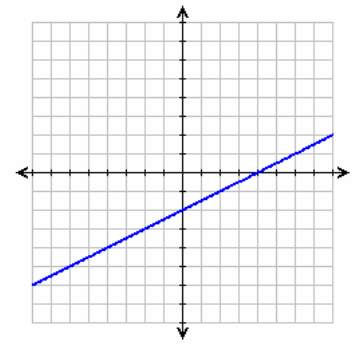
[a]



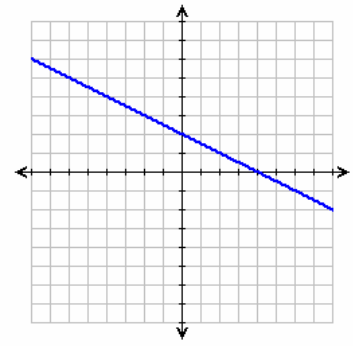
[b]



[c]



[d]



33. Tasty Bakery sells two kinds of muffins: Chocolate Chip Muffins at 45¢ each and Cranberry Muffins at 40¢ each. Sean buys some of each kind of muffins. If his bill is $6.30 for 15 muffins, how many Chocolate Chip Muffins did he buy?

[a] 9

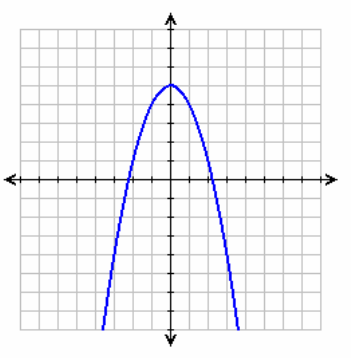
[b] 7

[c] 6

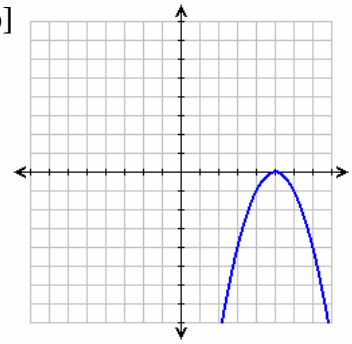
[d] 5

34. Choose the correct graph for: $y = -x^2 - 5$

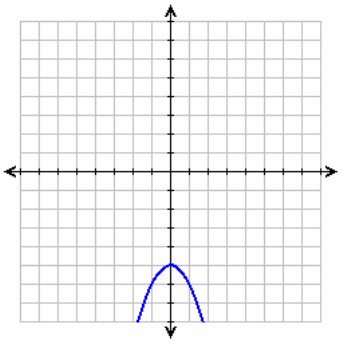
[a]



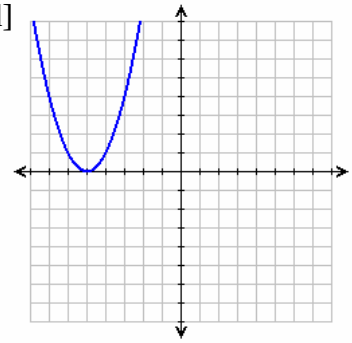
[b]



[c]



[d]



35. Divide: $\dfrac{5x^2-20}{4x-8} \div \dfrac{5x^2+20x+20}{2x^2+14x+20}$

[a] $\dfrac{x+5}{2}$

[b] $2(x+5)$

[c] $\dfrac{25(x+2)^2}{8(x+5)}$

[d] $\dfrac{5(x+5)}{2}$

36. Divide and write in $a+bi$ form: $\dfrac{6+2i}{1+i}$

[a] 4

[b] $2-2i$

[c] $3+i$

[d] $4-2i$

37. Solve for x: $\sqrt{10-5x}-x=-2$

[a] $x=2,7$

[b] $x=-3,2$

[c] $x=2$

[d] There are no solutions

38. The cost of producing n items is given as $C(n)=n^2-3n-18$. Find n when the cost is \$10.

[a] $n=-218$

[b] $n=6$

[c] $n=7$

[d] $n=-180$

39. The sum of two integers is eleven. One less than twice the larger number is five times the smaller number. What is the larger number?

[a] 15

[b] 8

[c] 9

[d] 3

40. It takes Danny three times as long to mow a field as it takes his father. Together they can mow the same field in four hours. How long does it take Danny working alone?

[a] $3hrs$

[b] $5hrs,\ 20min$

[c] $16hrs$

[d] $6hrs,\ 10min$

41. Jerry has thirty coins consisting of quarters and some dimes. Their total value is $4.95. How many of the coins are quarters?

[a] 17

[b] 11

[c] 19

[d] 13

42. Solve using the *quadratic formula*: $4x^2 = 2x - 11$

[a] $x = \frac{1 \pm 2\sqrt{11}}{4}$

[b] $x = \frac{1 \pm 2i\sqrt{43}}{4}$

[c] $x = \frac{2 \pm i\sqrt{43}}{4}$

[d] $x = \frac{1 \pm i\sqrt{43}}{4}$

43. A small plane went 240 miles in 3 hours flying against the wind and the same amount of time to go 300 miles with the wind. What was the speed of the plane without the wind?

[a] 10*mph*

[b] 80*mph*

[c] 95*mph*

[d] 90*mph*

44. John used 5 gallons of blue paint and 8 gallons of white paint on his house. Kim used only 3 gallons of blue, but 11 gallons of white at the same prices per gallon as John's paint. If John spent $197 and Kim spent $205, how much was the blue paint per gallon?

[a] $20.46

[b] $14

[c] $11.94

[d] $17

45. Determine $f(-4)$ for: $f(x) = 3x + 5$

[a] -7

[b] 3

[c] $3x + 1$

[d] -3

46. Which of the following equations gives the solutions of $3x^2 + 12x - 15 = 0$ when using the method of *completing the square*:

[a] $(x+3)^2 = 5$

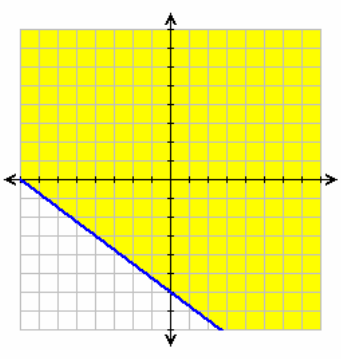
[b] $(x+2)^2 = 9$

[c] $(3x+6)^2 = 15$

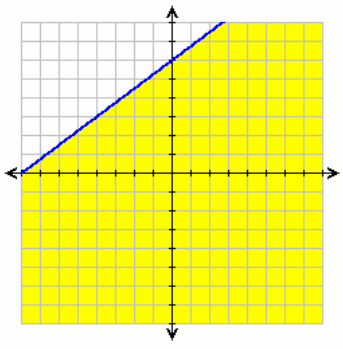
[d] $(3x+6)^2 = 51$

47. Graph: $y \le \frac{3}{4}x + 6$

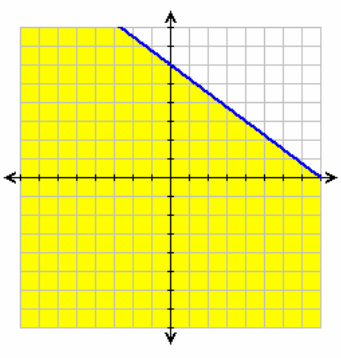
[a]



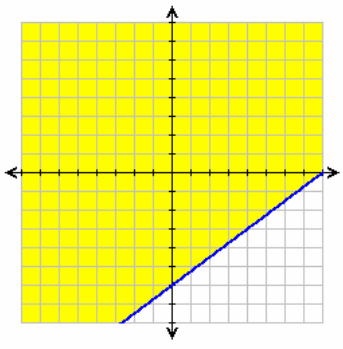
[b]



[c]



[d]



48. Solve: $\frac{1}{2} - 3x = 1$

[a] $-\frac{1}{6}$

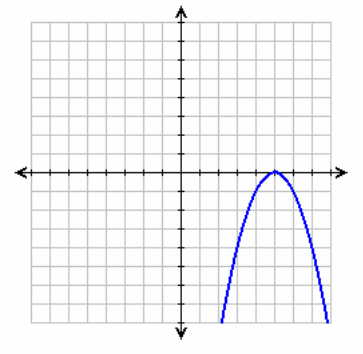
[b] $\frac{3}{2}$

[c] $\frac{1}{6}$

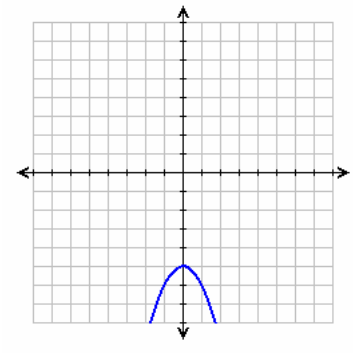
[d] $\frac{2}{3}$

49. Choose the correct graph for: $y = -x^2 + 5$

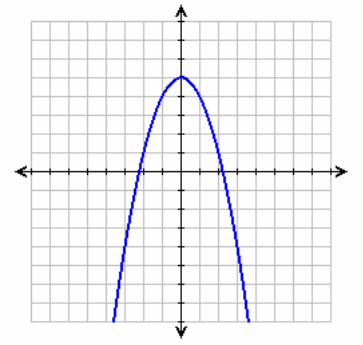
[a]



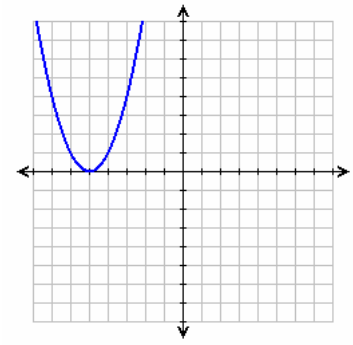
[b]



[c]



[d]



50. Solve for x: $(2x-4) - 3(4x+1) + 2(x+3) = 0$

[a] $x = \frac{1}{8}$

[b] $x = -8$

[c] $x = -\frac{1}{8}$

[d] $x = 8$

51. Solve for x: $x^2 - 5x = -4$

[a] $\{1, 4\}$

[b] $\{-4, 1\}$

[c] $\{-4, -1\}$

[d] $\{-1, 4\}$

52. Simplify: $x\sqrt{32x^2} + x^2\sqrt{8}$

[a] $6x\sqrt{2}$

[b] $6x^2\sqrt{2}$

[c] $6x^2$

[d] $6\sqrt{2x^2}$

53. Perform the indicated operation: $\dfrac{2}{1+i}$

[a] $1+i$

[b] $\dfrac{2}{1+i}$

[c] $1-i$

[d] $\dfrac{1}{2} - \dfrac{1}{2}i$

54. Find the equation of the line that passes through the points $(2,0)$ and $(0,3)$.

[a] $y = -\dfrac{2}{3}x + 3$

[b] $y = -\dfrac{3}{2}x + 2$

[c] $y = -\dfrac{2}{3}x + 2$

[d] $y = -\dfrac{3}{2}x + 3$

55. Find the equation of the line that contains the point $(2,-1)$ and has slope $\frac{1}{2}$.

[a] $x-2y=0$

[b] $x-2y=2$

[c] $2x+y=-2$

[d] $x-2y=4$

56. Find the equation of the line that is perpendicular to $x+2y=1$ and passes through the point $(0,3)$.

[a] $y=2x+3$

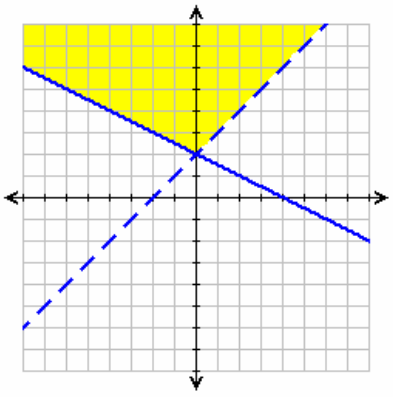
[b] $y=\frac{1}{2}x+3$

[c] $y=-2x+3$

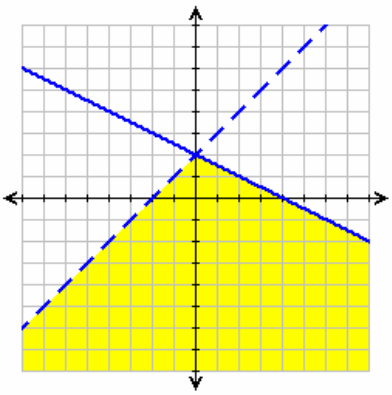
[d] $y=-\frac{1}{2}x+3$

57. Graph the solution for this system: $y-2\geq x$
$x+2y<4$

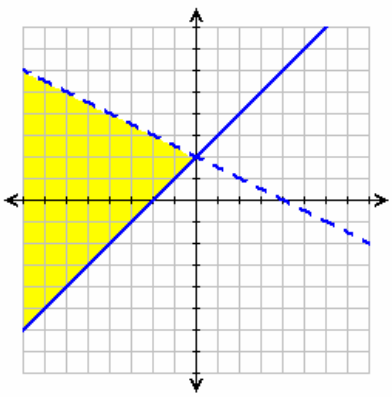
[a]



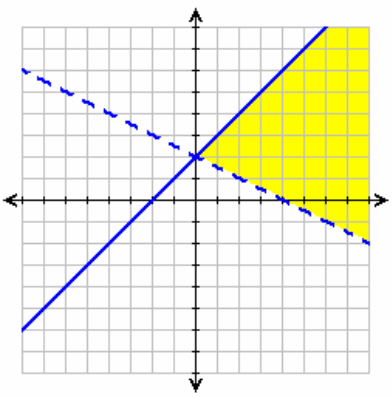
[b]



[c]



[d]



58. Solve: $\sqrt{2x+5} = x+1$

[a] $\{-2, 0\}$

[b] $\{2\}$

[c] $\{0, 2\}$

[d] $\{-2, -2\}$

59. Identify a factor of: $6x^2 + 13x - 5$

[a] $(3x+1)$

[b] $(3x-5)$

[c] $(3x-1)$

[d] $(2x-5)$

60. Evaluate: $(-3)^2 (8-5) \div 3 + 6$

[a] 15

[b] -15

[c] 3

[d] -3

61. Solve for x: $ax + by = cx + d$

[a] $\dfrac{by+d}{a-c}$

[b] $\dfrac{d-by}{a-c}$

[c] $\dfrac{by-d}{a-c}$

[d] Cannot be solved for x

ANSWER KEY

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