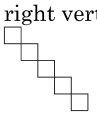
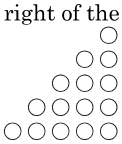
Algebra 2
Lesson 1-1 - Practice and Problem-Solving Exercises Answers

8. One square, with the number of squares increasing by one. The top left vertex of the added square is the same as the bottom right vertex of the previous square.

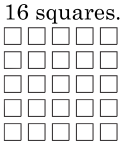


9. Base of 3 squares with the number of squares increasing vertically by one on each of the outer squares of the base.

10. One circle, then 1 + 2 or 3 circles, then 1 + 2 + 3 or 6 circles. In general, the number of circles is increasing vertically by n to the right of the previous figure.



11. One square, then 2^2 or 4 squares, then 3^2 or 9 squares, then 4^2 or 16 squares. In general, the number of squares is $n \times n$ or n^2.



12. $25 - n$

Input	Process Column	Output
1	24	24
2	24 − 1	23
3	24 − 2	22
4	24 − 3	21
⋮	⋮	⋮
n	24 − (n − 1)	25 − n

13. $2n$

Input	Process Column	Output
1	2(1)	2
2	2(2)	4
3	2(3)	6
4	2(4)	8
⋮	⋮	⋮
n	2(n)	2n

14. $5 + 5n$

Input	Process Column	Output
1	5 + 5(1)	10
2	5 + 5(2)	15
3	5 + 5(3)	20
4	5 + 5(4)	25
⋮	⋮	⋮
n	5 + 5(n)	5 + 5n

15. $4n - 1$

Input	Process Column	Output
1	4(1) − 1	3
2	4(2) − 1	7
3	4(3) − 1	11
4	4(4) − 1	15
⋮	⋮	⋮
n	4(n) − 1	4n − 1

16. 4; 5; $n - 1$

17. 7; 8; $n + 2$

18. -15; -18; $-3n$

19. Output = Input + 1

Input	Process Column	Output
1	(1) + 1	2
2	(2) + 1	3
3	(3) + 1	4
4	(4) + 1	5
5	(5) + 1	6
⋮	⋮	⋮
n	(n) + 1	n + 1

20. Output = $\frac{1}{2}$ Input

Input	Process Column	Output
1	$(1) \cdot \frac{1}{2}$	$\frac{1}{2}$
2	$(2) \cdot \frac{1}{2}$	1
3	$(3) \cdot \frac{1}{2}$	$1\frac{1}{2}$
4	$(4) \cdot \frac{1}{2}$	2
5	$(5) \cdot \frac{1}{2}$	$2\frac{1}{2}$
⋮	⋮	⋮
n	$(n) \cdot \frac{1}{2}$	$\frac{1}{2}n$

21. Output = Input − 1

Input	Process Column	Output
1	(1) − 1	0
2	(2) − 1	1
3	(3) − 1	2
4	(4) − 1	3
5	(5) − 1	4
⋮	⋮	⋮
n	(n) − 1	n − 1

22. 10

23. 40

24. $2n$

25. add 6 or $6n$; 30, 36, 42

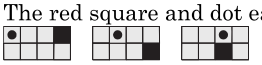
26. add 3; subtract 1; 8, 7, 10

27. $\frac{1}{2}(n+1)(n+2)$; 21, 28, 36

28. add 4; 18, 22, 26

29. multiply by 3; 243, 729, 2187

30. multiply by 5; 2500, 12,500, 62,500

31. The red square and dot each move clockwise one block.


32. Answers may vary. Sample:
Multiply each input by 4.

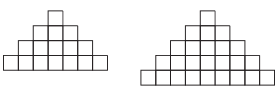
33. 9216 in.^{3}

34a.

Input	Output
1	3
2	6
3	9
4	12
5	15
⋮	⋮
n	$3n$

34b. 18; 21; 24

35. $n+10$, where n is the number of months

36a.


36b. Process Column: (1), 2(2), 3(3), 4(4), 5(5); Number of squares: 1, 4, 9, 16, 25

36c. n^2

37. 21; $4n + 1$

38. -18; $7 - 5n$

39. -13; $7 - 4n$

40. Check students' work.

41. Answers may vary. Sample:
Jesse will not grow at the same rate between the ages of 15 and 20 as he has during the 4 years prior to age 15.

42. The Sierpinski Triangle is formed by connecting the midpoints of the sides of an equilateral triangle, forming 4 smaller triangles, deleting the middle triangle. Repeat the process of connecting the midpoints of the sides of the remaining 3 triangles and deleting the middle triangle of each new set of triangles.

43. D

44. H

45a. Each number is a result of the division of the preceding number by 2.

45b. $36 \div 2 = 18$
$18 \div 2 = 9$
$9 \div 2 = 4.5$
So, 4.5 is the first non-integer number.

46. 1.9

47. -3.8

48. 27

49. 0

50. -0.4

51. 7

52. 50%

53. 25%

54. 33.3%

55. 140%

56. 172%

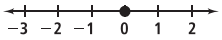
57. 123%

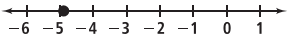
Algebra 2
Lesson 1-2 - Practice and Problem-Solving Exercises Answers

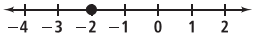
10. whole numbers, rational numbers

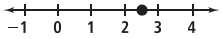
11. natural numbers, rational numbers

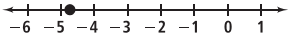
12. C, irrational numbers; r, rational numbers

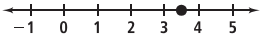
13. 

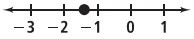
14. 

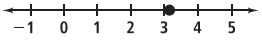
15. 

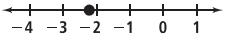
16. 

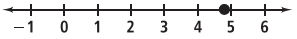
17. 

18. 

19. 

20. 

21. 

22. 

23. >

24. <

25. <

26. >

27. >

28. <

29. >

30. <

31. >

32. <

33. <

34. >

35. Distr. Prop.

36. Comm. Prop. of Add.

37. Assoc. Prop. of Mult.

38. Comm. Prop. of Mult.

39. Ident. Prop. of Add.

40. Inv. Prop. of Mult.

41. Answers may vary. Sample: -5

42. Answers may vary. Sample: $-3\frac{1}{2}$

43. Answers may vary. Sample: $-1\frac{1}{4}$

44. Answers may vary. Sample: $\frac{1}{2}$

45. Answers may vary. Sample: $1\frac{2}{3}$

46. Answers may vary. Sample: $3\frac{1}{3}$

47. Answers may vary. Sample: 4

48. Answers may vary. Sample:
4.8

49. $\sqrt{50}$ in. $\times \sqrt{50}$ in. $\times \sqrt{50}$ in.

50. The point for $\sqrt{5}$ is not at the correct position on the number line; $\sqrt{5} \approx 2.24$.

51. natural numbers

52. irrational numbers

53. irrational numbers

54. rational numbers

55. irrational numbers

56. irrational numbers

57. $8,\ 1,\ \frac{1}{3},\ -\sqrt{2},\ -3$

58. $11,\ \sqrt{14},\ \frac{5}{2},\ 1,\ -\frac{9}{16}$

59. $5.73,\ \frac{1}{4},\ -0.06,\ -3\sqrt{3},\ -17$

60. Answers may vary. Sample:
4

61. Answers may vary. Sample:
7

62. Answers may vary. Sample:
−1

63. Answers may vary. Sample:
$\sqrt{2}$ and $\sqrt{2}$

64. Answers may vary. Sample:
$\sqrt{4}$

65. Check students' work.

66. Multiply the cost of a drink by 5 and multiply the cost of a sandwich by 5, then add, or add the cost for one drink and one sandwich, then multiply by 5; Distr. Prop., $5s + 5d = 5(s + d)$

67. Check students' work.

68. No. Answers may vary. Sample:
The only pairs of integers that have a product of -12 are -1 and 12, -2 and 6, -3 and 4, -4 and 3, -6 and 2, -12 and 1. None of these pairs has a sum of -3.

69. $5(x + 2y - 7)$

70a. $\pi \approx 3.141592654...$
No, π is an irrational number.

70b. $\frac{22}{7} \approx 3.142857143...;\ \frac{22}{7} > \pi$

71. No; $\frac{1}{0}$ is undefined.

72. B

73. H

74. $\left(-\frac{1}{5}\right)$

75. The pattern is add 4 to the previous term.
The next three terms are 20, 24, 28.

76. The pattern is add 1 to the previous term.
The next three terms are 12, 13, 14.

77. The pattern is add 1 to the previous term.
The next three terms are 0, 1, 2.

78. $2\frac{1}{4}$

79. $11\frac{2}{3}$

80. $1\frac{1}{2}$

81. 5

82. 38

83. 15

Algebra 2
Lesson 1-3 - Practice and Problem-Solving Exercises Answers

10. $b+4$

11. $8(x+3)$

12. $\frac{5-n}{2}$

13. $130-10w$
Let w = number of weeks

14. $25+1.5d$
Let d = number of days

15. $250-60w$
Let w = number of weeks

16. -30

17. -16

18. -70

19. -12

20. 1 ft

21. 4 ft

22. 64 ft

23. 1600 ft

24. \$1210

25. \$1331

26. \$1464.10

27. \$1610.51

28. Let s = number of shots, $1s$; 8

29. Let x = 3-run homers and y = 2-run hits, $2x+4y$; 14

30. $4a$

31. $2s+5$

32. $-9a+b$

33. $6a+3b$

34. $10r+5s$

35. $-0.5x$

36. $-3a+15b$

37. $4g-2$

38. $-2x+4y$

39. 3

40. 11

41. 37

42. $\frac{41}{4}$

43. 10

44. -765

45. $\frac{\$84}{m}$; "Per" indicates division. Substituting 200 miles for m: $\frac{\$84}{200}=\$.42$. Yes, the answer makes sense.

46. $-\frac{3}{4}a^2+2b^2$

47. $\frac{5}{2}x^2$

48. $\frac{7y^2}{12}+\frac{2y}{15}$

49. y

50. $3x + 6y$

51. $-2x^2 + 2y^2$

52. $2x - 200$

53. $8.5x - 15$

54. It is the correct answer's opposite.
$a - b = -b + a$
$= -(b - a)$

55. No; John did not use the opposite of a sum correctly, nor did he use the Distributive Property correctly.
$-(x + y) + 3(x - 4y)$
$-x - y + 3x - 12y$
$2x - 13y$

56. Answers may vary. Sample:
x^2

57. Distr. Prop.

58. Opposite of an Opposite

59. Opposite of a Difference

60. Mult. by -1

61. Answers may vary. Sample:
$2(b - a) + 5(b - a)$
$= (2 + 5)(b - a)$ Distr. Prop.
$= 7(b - a)$ Add.
$= 7b - 7a$ Distr. Prop.

62a. 18

62b. $2x^2$; 18

62c. Properties of operations were used to simplify the original expression into an equivalent expression. Equivalent expressions have equal values for all values of their variables.

63. A

64. F

65. C

66. $\sqrt{26} > \sqrt{25}$ and $\sqrt{25} = 5$. So $\sqrt{26} > 5 > 4.9$ and by Transitive Prop. $\sqrt{26} > 4.9$.

67. $-1.5,\ -\sqrt{2},\ -1.4,\ -0.5$

68. $-\frac{5}{6},\ -\frac{3}{4},\ -\frac{3}{8},\ \frac{1}{2}$

69. $-20,\ 0.2,\ \frac{1}{2},\ \sqrt{2}$

70. $-3,\ -0.5,\ -\frac{1}{4},\ \frac{3}{4}$

71. $7x - 4$

72. $-p - \frac{2q}{3}$

73. $2b - 28$

74. $2k - 2m$

Algebra 2
Lesson 1-4 - Practice and Problem-Solving Exercises Answers

10. 18

11. -81

12. 12

13. 14

14. 23

15. 8

16. $\frac{17}{2}$

17. -5

18. $\frac{7}{2}$

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

20. $\frac{17}{7}$

21. $\frac{3}{2}$

22. 8

23. -6

24. 2

25. 0

26. 4 h

27. 300 mi/h; 600 mi/h

28. width = 4.5 cm; length = 7.5 cm

29. sometimes

30. never

31. sometimes

32. always

33. $\frac{2A}{b}$

34. $\frac{2s}{t^2}$

35. $\frac{V}{\ell h}$

36. $\frac{I}{pt}$

37. $\frac{c}{a+b}$, $a \neq -b$

38. $a(b+5)$, $a \neq 0$

39. $2(m+n)+2$

40. $\frac{5g}{2}-1$

41. 1.5

42. 3

43. $\frac{23}{3}$, or $7\frac{2}{3}$

44. $\frac{3}{2}$

45. 34° and 56°

46. $\frac{r_1 r_2}{r_1 + r_2}$

47. $\frac{2A}{h} - b_1$

48. $\frac{S - 2\pi r^2}{2\pi r}$

49. $\frac{h + 5t^2}{t}$

50. $\frac{2(v - s^2)}{s}$

51. $\frac{Rr_1}{r_1 - R}$

52. The account has a balance less then \$0, or you overdrew on the account by \$36.

53. 40°, 140°

54. 43, 45, 47, 49

55. $\frac{3b + 2c - 5}{b - c} = x$, with $b \neq c$

56. $x = \frac{2ab - 2c}{3at - cd}$, with $3at \neq cd$

57. $x = \frac{4a - 3bc}{aq - 5bp}$, with $5bp \neq aq$

58. $x = \frac{bc}{2ad} + 6$, with $a \neq 0$, $b \neq 0$, $d \neq 0$

59. $\frac{10c}{a}$, with $a \neq 0$

60. $x = \frac{a - c}{m} + a$, with $m \neq 0$ and $x \neq a$

61. Let c = number of swim days; $3c = 82 + c$; 41 days

62. first stage, 90 s; second stage, 62 s.

63. No; $n = \frac{s}{1 - s}$ ***not*** $\frac{s}{s - 1}$.

64a. Sample:
If you solve $ax - b = c$ for x, you get $x = \frac{b + c}{a}$. Since b and c are integers, $b + c$ is an integer. But a is a nonzero integer. So, $\frac{b + c}{a}$ is the quotient of two integers and hence, by the definition of a rational number, $\frac{b + c}{a}$ is a rational number.

64b. Solutions are rational when $\frac{c - b}{a} \geq 0$, $a \neq 0$, and $\frac{c - b}{a}$ is a perfect square.

65. 269 ft

66. 350 pieces

67. 3200

68. 17.9

69. 7

70. −7

71. $-\frac{16}{3}$

72. −20

73. $-\frac{11}{2}$

74. $x + 5$

75. $16x$

76. $3(12 - x)$

77. true

78. false

79. true

Algebra 2
Lesson 1-5 - Practice and Problem-Solving Exercises Answers

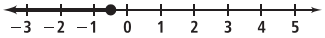
10. $x + 5 < -7$

11. $8x \geq 25$

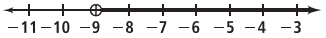
12. $x - 6 > 54$

13. $\frac{x}{12} \leq 6$

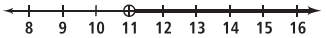
14. $x \leq -\frac{1}{2}$



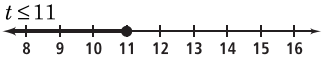
15. $k > -9$



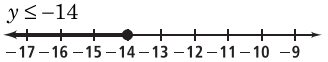
16. $a > 11$



17. $t \leq 11$

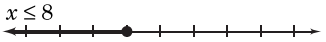


18. $y \leq -14$

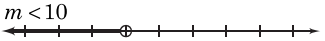


19. $y \leq -6$

20. $x \leq 8$

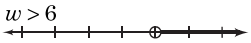


21. $m < 10$



22. $n > 8$

23. $w > 6$



24. The width is less than 11.5 in., and the length is 3 in. greater than the width.

25. The longest side is less than 21 cm.

26. The smaller number is an integer greater than or equal to 8.

27. 40 students

28. always

29. always

30. always

31. never

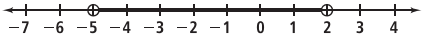
32. always

33. sometimes

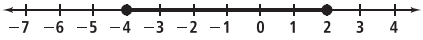
34. never

35. sometimes

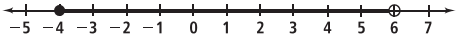
36. $-5 < x < 2$



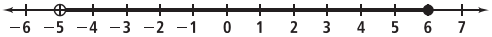
37. $-4 \leq x \leq 2$



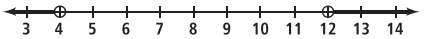
38. $-4 \leq x < 6$



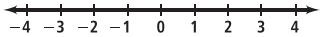
39. $-5 < x \leq 6$



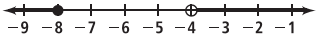
40. $x < 4$ or $x > 12$



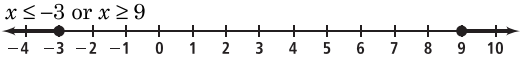
41. all real numbers



42. $x > -4$ or $x \leq -8$

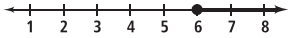


43. $x \leq -3$ or $x \geq 9$

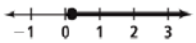


44. less than 36.57 seconds.

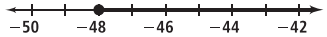
45. $z \geq 6$



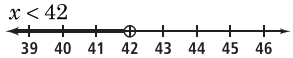
46. $x \geq \frac{1}{6}$



47. $x \geq -48$

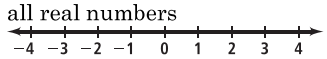


48. $x < 42$



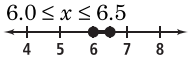
49. no solution

50. all real numbers



51. 98

52. $6.0 \leq x \leq 6.5$



53. $2 < AB < 6$

54. Check students' work.

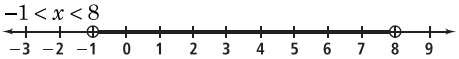
55. The classmate reversed the direction of the $\geq$ symbol to $\leq$ incorrectly. The correct answer is $y \leq -20$.

56. between \$204,000 and \$254,000.

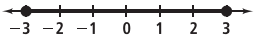
57. Dist. Prop.; arithmetic; Subtr. Prop. of Inequality; Mult. Prop. of Inequality

58. Mult. Prop of Inequality; Distr. Prop.; Add. Prop. of Inequality; Subtr. Prop. of Inequality; Div. Prop. of Inequality

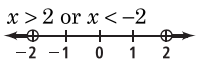
59. $-1 < x < 8$



60. $-3 \leq x \leq 3$



61. $x > 2$ or $x < -2$



62. Answers may vary. Sample:
$2x - 7 \geq -11$

63. Answers may vary. Sample:
$-3x + 1 > 4$

64. Answers may vary. Sample:
$-9 < 5x + 1 < 6$

65. Answers may vary. Sample:
$2x + 4 \leq 0$ or $-3x - 3 \leq 0$

66a. no

66b. yes; values of a that are 8 or greater

66c. (a) yes; values of a that are less than 8
(b) no

67. D

68. I

69. D

70.
$$3(x-2)+8=12$$
$$3x-6+8=12 \quad \text{Distr. Prop.}$$
$$3x+2=12 \quad \text{Simplify.}$$
$$3x=10 \quad \text{Subt. Prop. of Eq.}$$
$$x=\frac{10}{3} \quad \text{Div. Prop. of Eq.}$$

71. $7a + 5$

72. $-2x + 14y$

73. $\frac{b}{12} + 1$

74. $1.61 - 0.1k$

75. 4

76. no solution

77. $\frac{9}{10}$

78. -20

Algebra 2
Lesson 1-6 - Practice and Problem-Solving Exercises Answers

10. $-6,\ 6$

11. $-8,\ 8$

12. $-6,\ 12$

13. $-\frac{5}{3},\ 3$

14. no solution

15. no solution

16. $-18,\ 10$

17. $|y-5|-2=10$
$|y-5|=12$
$y-5=12$ or $y-5=-12$
$y=17$ or $y=-7$
$-7,\ 17$

18. $-7,\ 15$

19. $-\frac{3}{2}$

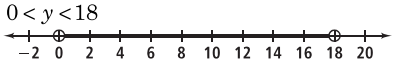
20. $\frac{2}{3}$

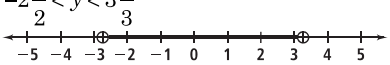
21. $\frac{3}{2}$

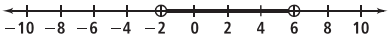
22. $-4,\ 8$

23. $-1,\ \frac{3}{2}$

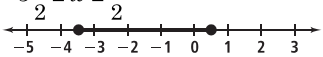
24. 1

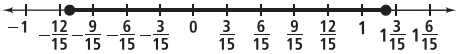
25. $0 < y < 18$


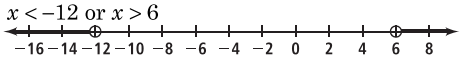
26. $-2\frac{3}{2} < y < 3\frac{1}{3}$


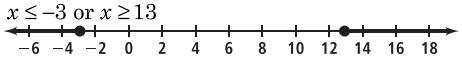
27. $-2 < x < 6$


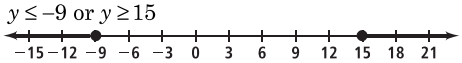
28. no solution

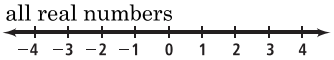
29. $-3\frac{1}{2} \le w \le \frac{1}{2}$


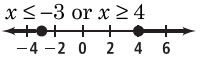
30. $-\frac{11}{15} \le t \le \frac{17}{15}$


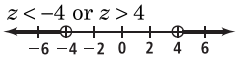
31. $x < -12$ or $x > 6$


32. $x \le -3$ or $x \ge 13$


33. $y \le -9$ or $y \ge 15$


34. all real numbers


35. $x \le -3$ or $x \ge 4$


36. $z < -4$ or $z > 4$


37. $|h-1.4| \le 0.1$

38. $|k-50.5| \le 0.5$

39. $|C-27.5| \le 0.25$

40. $|b-52.5| \le 2.5$

41. $|m-1250| \le 50$

42. $|d-0.11885| \le 0.00015$

43. no solution

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

45. $-\frac{14}{3},\ \frac{16}{3}$

46. $-\frac{1}{3}$

47. no solution

48. $\frac{5}{2}$

49. $\frac{11}{8}$

50. $-1,\ -3$

51. $-\frac{71}{36}$

52. 2

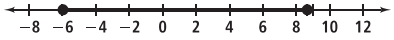
53. $|c-28.75| \le 0.25$; $28.50 \le c \le 29.00$

54. $|x| = 3$

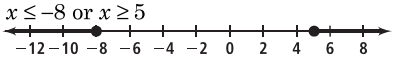
55. $|x| < 4$

56. $|x| \ge 1.5$

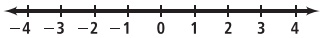
57. $-6 \le x \le 8\frac{2}{3}$



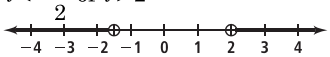
58. $x \le -8$ or $x \ge 5$



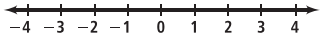
59. all real numbers



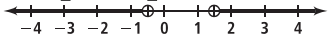
60. $t < -\frac{3}{2}$ or $t > 2$



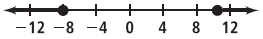
61. all real numbers



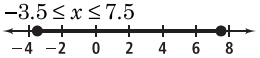
62. $x < -\frac{1}{2}$ or $x > \frac{3}{2}$



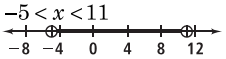
63. $x \le -8.4$ or $x \ge 9.6$



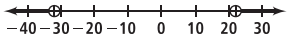
64. $-3.5 \le x \le 7.5$



65. $-5 < x < 11$



66. $x < -32$ or $x > 22$



67. The graph of $|x| < a$ is the set of all points on the number line that lie between a and $-a$. The graph of $|x| > a$ has two parts: the left part consists of the points to the left of $-a$, and the right part consists of the points to the right of a.

68. Answers may vary. Sample:
$|x-1| \ge 0$; $|x| < -5$

69. $|t-350| \le 5$

70. $|c-11| \le 1$

71. $|t-15| \le 30$

72. $|x-36.80| \le 0.05$
$36.75 \le x \le 36.85$

73. $|x-9.55| \le 0.02$
$9.53 \le x \le 9.57$

74. x is in inches, $|x-3600| \le 4,\ 3596 \le x \le 3604$

75. never

76. never

77. sometimes

78. sometimes

79. sometimes

80. never

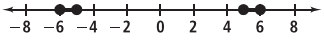
81. The "3" in the second set of equations should be "-3."
$-4x+1<-3$
$-4x<-4$
$x>1$ *not* $x>-\frac{1}{2}$

82. $x=\frac{b+c}{a}$ or $x=-\frac{b+c}{a},\ a\neq 0,\ b+c\ge 0$

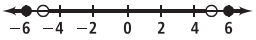
83. $x=\frac{ab+d}{c}$ or $x=\frac{-ab+d}{c},\ c\neq 0,\ ab\ge 0$

84. $x=\frac{ac+d}{ab}$ or $x=\frac{ac-d}{ab},\ ab\neq 0,\ \frac{d}{a}\ge 0$

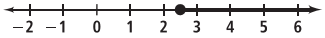
85. $(-6\le x\le -5)$ or $(5\le x\le 6)$



86. $(x\le -6)$ or $(-5<x<5)$ or $(x\ge 6)$



87. $x\ge\frac{5}{2}$



88. $|x+3|>4$ becomes $x+3>4$ or $x+3>-4$. $x+3$ is outside the interval from -4 to 4 so the solution is an *or* solution. $|x+3|<4$ becomes $-4<x+3<4$ so the solution is an *and* solution.

89. Use *and* if the absolute value is less than a value, and use *or* if the absolute value is greater than a value.

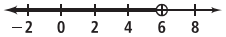
90. $\frac{11}{3}$

91. 0

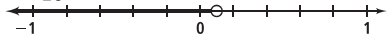
92. 1.875

93. 0.04

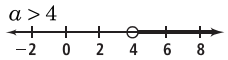
94. $y<6$



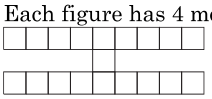
95. $s<\frac{2}{15}$



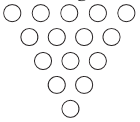
96. $a>4$



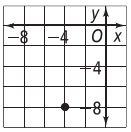
97. Each figure has 4 more squares than the previous figure.



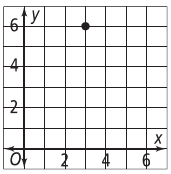
98. Each figure n has n more circles than the previous figure.



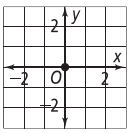
99. $(-4,\ -8)$



100. $(3,\ 6)$



101. $(0,\ 0)$



102. $(-1,\ 3)$