

Geometry Summer Prep: Algebra 1 Basics

Use these problems as a review for Algebra 1 problems as your student prepares for Geometry! Please see the QR code on the last page, this will take you worked out solutions for each problem!

1. Solve for y .

$$-11 = -22 + \frac{y}{5}$$

$$\boxed{y = 55}$$

2. Solve for b .

$$6b - 11 = -23$$

$$\boxed{b = -2}$$

3. Solve for c .

$$89 = 8c + 25$$

$$\boxed{c = 8}$$

4. Solve for x :

$$-7x - 2 = -6x + 1$$

$$\boxed{x = -3}$$

5. Solve for x :

$$-13x + 7 = -9x + 11$$

$$\boxed{x = -1}$$

6. Solve for x :

$$-12x - 7 = -8x - 19$$

$$\boxed{x = 3}$$

7. Solve. $2(2x + 7) = 42$

$$\boxed{x = 7}$$

8. Solve. $2(6y - 7) = -2$

$$\boxed{y = 1}$$

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9. Solve. $6(z + 10) = 48$

$$z = -2$$

10. Solve for x.

$$-2(5x - 4) - 2x + 5 = 49$$

$$x = -3$$

11. Solve for x.

$$-2(5x + 4) + x + 4 = 32$$

$$x = -4$$

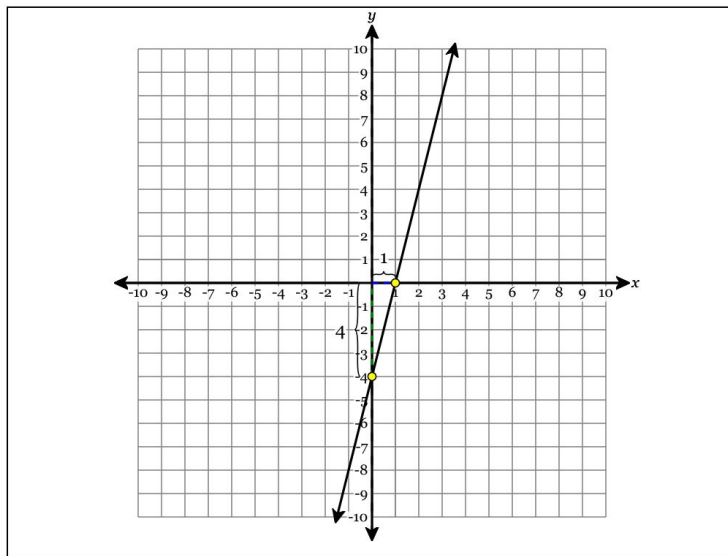
12. Solve for x.

$$-2(-3x + 3) - 2x - 1 = 17$$

$$x = 6$$

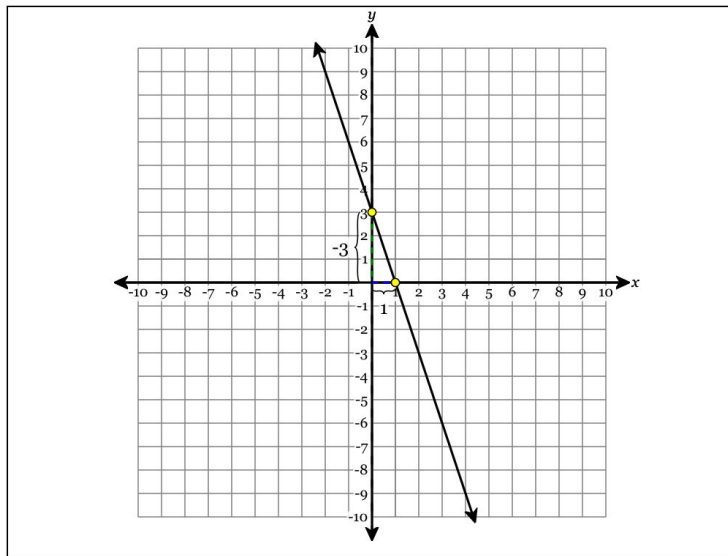
13. Graph the following features:

- Y-intercept = -4
- Slope = 4



14. Graph the following features:

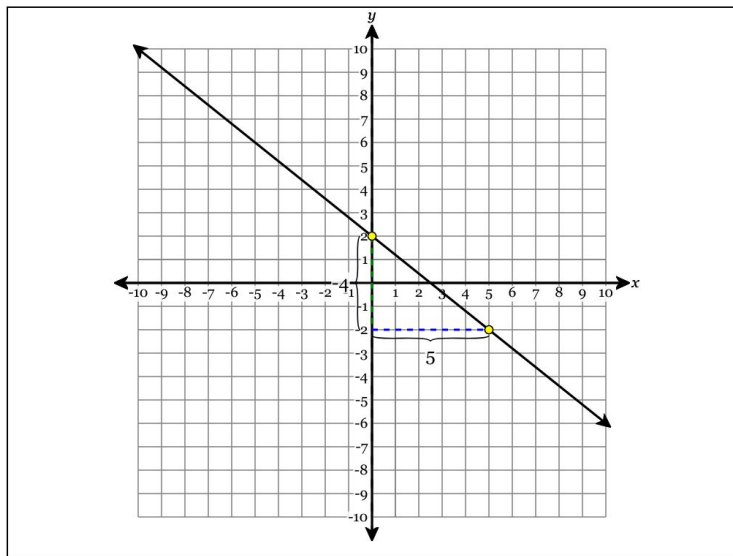
- Y-intercept = 3
- Slope = -3



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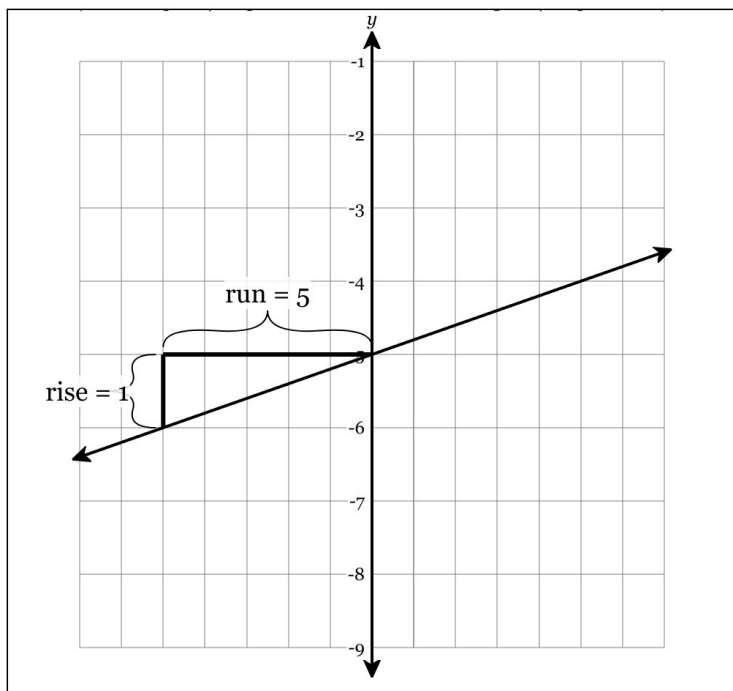
15. Graph the following features:

- Slope = $-\frac{4}{5}$
- Y-intercept = 2



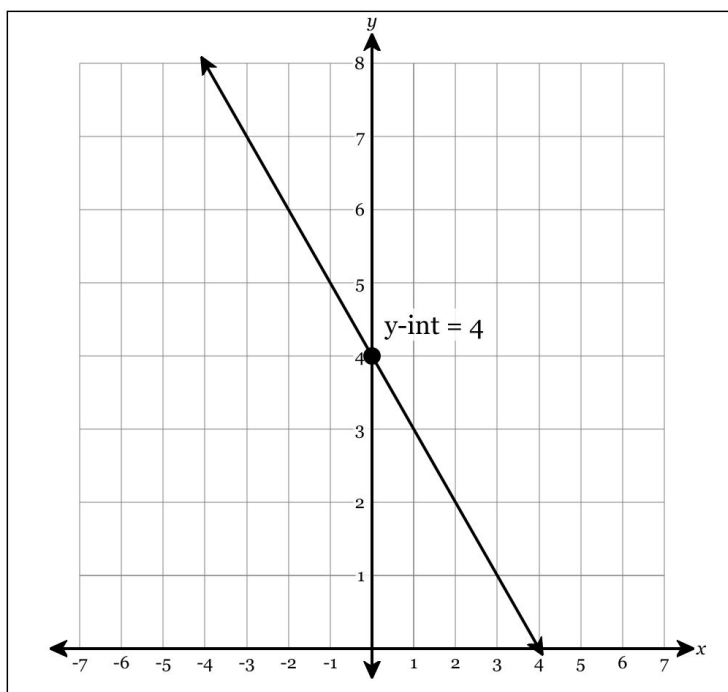
16. Find the slope of the line represented by the equation below.

$$25 = -5y + x$$



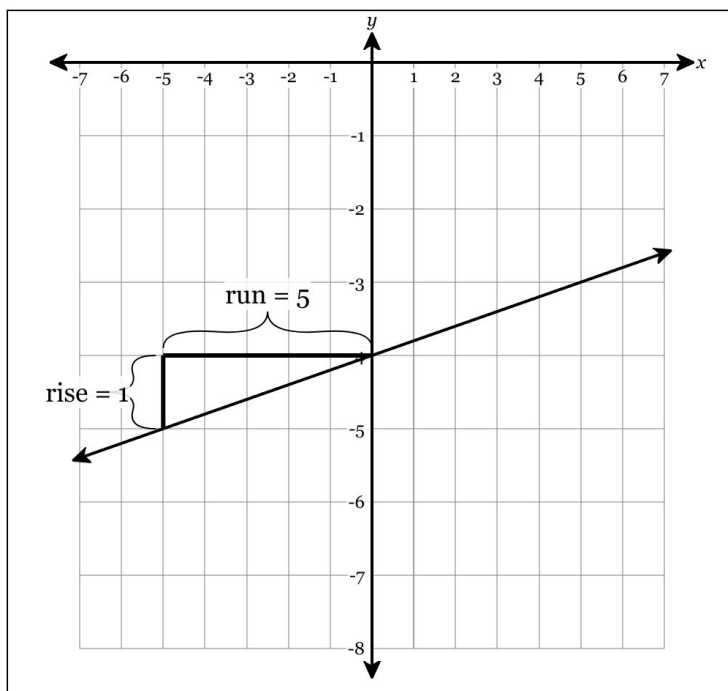
17. Find the y-intercept of the line represented by the equation below.

$$20 = 5y + 5x$$



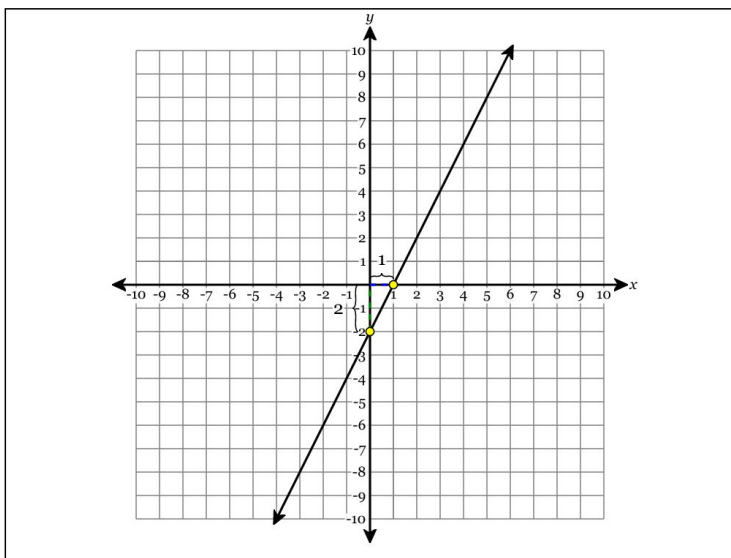
18. Find the slope of the line represented by the equation below.

$$-5y + x = 20$$

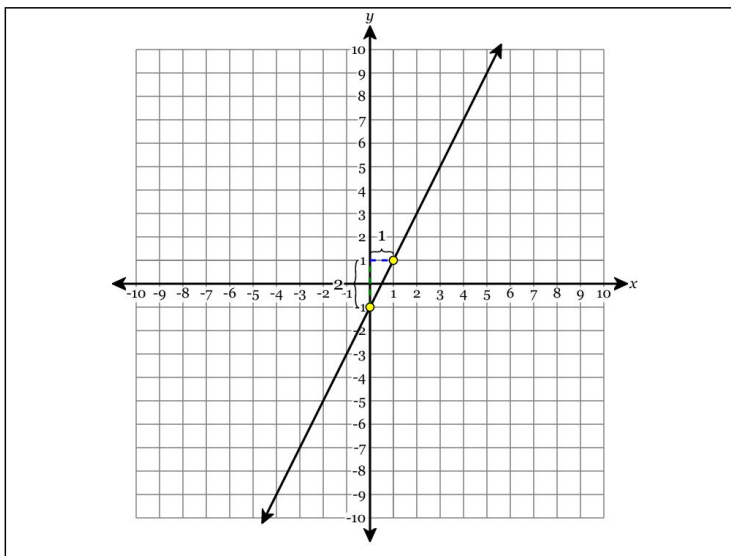


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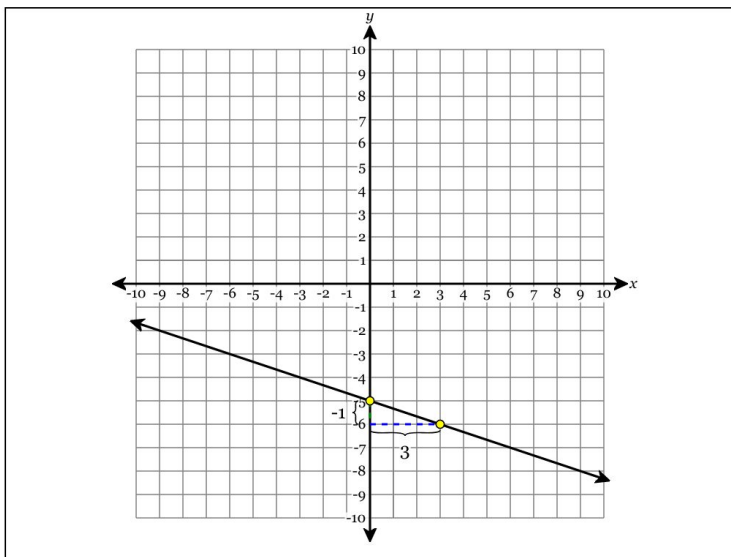
19. Graph the line with the equation $y = 2x - 2$.



20. Graph the line with the equation $y = 2x - 1$.

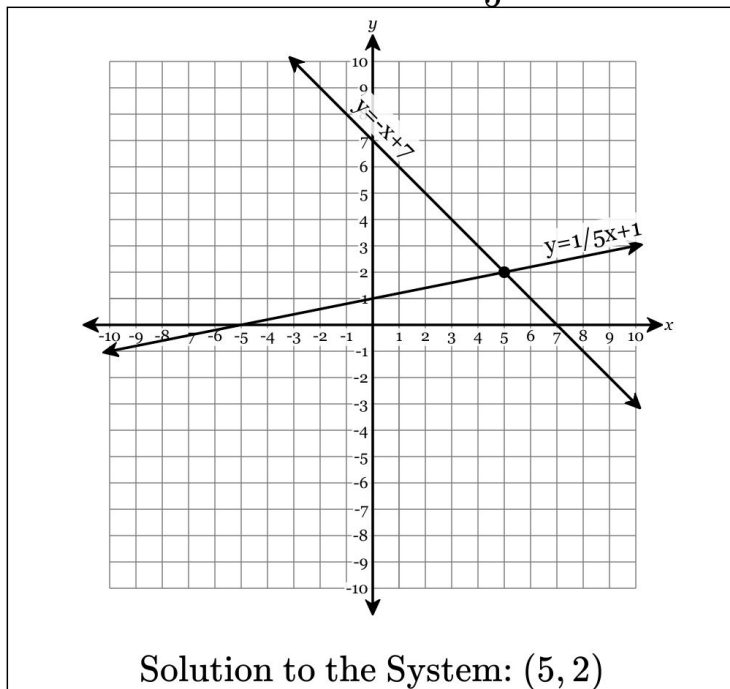


21. Graph the line with the equation $y = -\frac{1}{3}x - 5$.



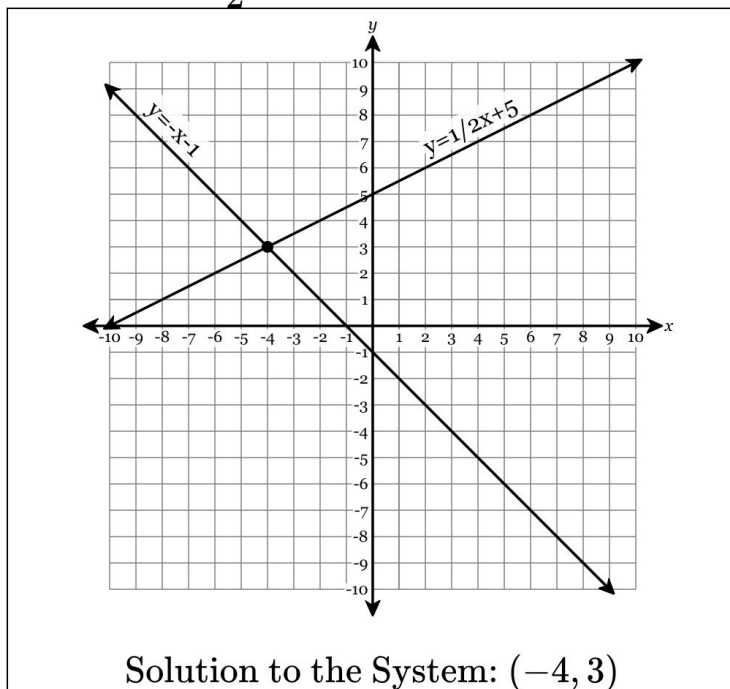
22. Solve the following system of equations graphically on the set of axes below and state the coordinates of the solution.

$$y = -x + 7 \quad y = \frac{1}{5}x + 1$$



23. Solve the following system of equations graphically on the set of axes below and state the coordinates of the solution.

$$y = \frac{1}{2}x + 5 \quad y = -x - 1$$



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24. Find the solution of the system of equations.

$$3x + 3y = -6$$

$$10x + 3y = -13$$

$$\boxed{(-1, -1)}$$

25. Find the solution of the system of equations.

$$3x + 7y = -17$$

$$-3x + 9y = -15$$

$$\boxed{(-1, -2)}$$

26. Solve the system by substitution.

$$y = 8x$$

$$y = 10x - 4$$

$$\boxed{(2, 16)}$$

27. Solve the system by substitution.

$$y = 5x$$

$$y = -3x + 24$$

$$\boxed{(3, 15)}$$

28. Combine like terms.

$$4x + 4y^3 - 5 + 6 - 2y^3 - 5y^3 + 5x$$

$$\boxed{9x - 3y^3 + 1}$$

29. Combine like terms.

$$2 - 4y^3 + 5y^3 + y^3 + 2 + 5x^3 + 2$$

$$\boxed{6 + 2y^3 + 5x^3}$$

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30. Combine like terms.

$$-6 - 2y^2 + 6x - 4x + 1 + 7y^2 - y^2$$

$$\boxed{-5 + 4y^2 + 2x}$$

31. Simplify: $y \cdot y^3$

$$\boxed{y^4}$$

32. Simplify: $(d^5)^2$

$$\boxed{d^{10}}$$

33. Simplify: $(r^3)^5$

$$\boxed{r^{15}}$$

34. Distribute $-2(-4x^2 - 2x)$.

$$\boxed{8x^2 + 4x}$$

35. Distribute $-9(x + 8)$.

$$\boxed{-9x - 72}$$

36. Distribute $3x(3x + 7)$.

$$\boxed{9x^2 + 21x}$$

37. Fully simplify. $2x^4y^3(5x)$

$$\boxed{10x^5y^3}$$

38. Fully simplify. $-5y^5(-4x^4)$

$$\boxed{20x^4y^5}$$

39. Fully simplify. $-2xy^4(7x^2)$

$$\boxed{-14x^3y^4}$$

40. Fully simplify. $(3x^3y^5)^4$

$$\boxed{81x^{12}y^{20}}$$

41. Fully simplify. $(-5x^5y^2)^5$

$$\boxed{-3125x^{25}y^{10}}$$

42. Fully simplify. $(6x^4y)^3$

$$\boxed{216x^{12}y^3}$$

43. Fully simplify using only positive exponents.

$$\frac{9x^2y^7}{x^8y^4}$$

$$\boxed{\frac{9y^3}{x^6}}$$

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44. Fully simplify using only positive exponents.

$$\frac{25x^8y^6}{5x^3y^5}$$

$$\boxed{5x^5y}$$

45. Fully simplify using only positive exponents.

$$\frac{9x^8y^5}{9x^8y^4}$$

$$\boxed{y}$$

46. Identify the greatest common factor of $20xy$ and 45 .

$$\boxed{5}$$

47. Identify the greatest common factor of $18bc$ and $50b$.

$$\boxed{2b}$$

48. Identify the greatest common factor of $15cwy$ and $30x$.

$$\boxed{15}$$

49. Identify the greatest common factor of $27wxy^3$ and $39a^2xy$.

$$\boxed{3xy}$$

50. Identify the greatest common factor of $40cw^2y^2$ and $30w$.

$$\boxed{10w}$$

51. Identify the greatest common factor of $21b^2w^2y^3$ and $24b^3y$.

$$\boxed{3b^2y}$$

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52. Factor the expression completely: $63x^2 + 18$

$$9(7x^2 + 2)$$

53. Factor the expression completely: $10x + 40$

$$10(x + 4)$$

54. Factor the expression completely: $27 + 9x$

$$9(3 + x)$$

55. Factor $x^2 - 2x - 3$

$$(x + 1)(x - 3)$$

56. Factor $x^2 + x - 6$

$$(x - 2)(x + 3)$$

57. Factor $x^2 - x - 2$

$$(x + 1)(x - 2)$$

58. Factor the trinomial: $3x^2 + 14x + 15$

$$(3x + 5)(x + 3)$$

59. Factor the trinomial: $3x^2 + 7x + 4$

$$(3x + 4)(x + 1)$$

60. Factor the trinomial: $3x^2 + 19x + 6$

$$(3x + 1)(x + 6)$$

61. Express in simplest radical form: $\sqrt{112}$

$$4\sqrt{7}$$

62. Express in simplest radical form: $\sqrt{162}$

$$9\sqrt{2}$$

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63. Express in simplest radical form: $\sqrt{75}$

$$\boxed{5\sqrt{3}}$$

64. Express in simplest radical form given $x > 0$.

$$9\sqrt{10x^2} - 4x\sqrt{40}$$

$$\boxed{x\sqrt{10}}$$

65. Express in simplest radical form given $x > 0$.

$$-9x\sqrt{24} + 4\sqrt{6x^2}$$

$$\boxed{-14x\sqrt{6}}$$

66. Express in simplest radical form given $x > 0$.

$$-\sqrt{90x^4} + 6x^2\sqrt{160}$$

$$\boxed{21x^2\sqrt{10}}$$

67. Use the quadratic formula to solve. Express your answer in simplest form.

$$9k^2 - 6k - 8 = 0$$

$$\boxed{k = \frac{4}{3}, \quad k = -\frac{2}{3}}$$

68. Use the quadratic formula to solve. Express your answer in simplest form.

$$3r^2 + 10r - 8 = 0$$

$$\boxed{r = \frac{2}{3}, \quad r = -4}$$

69. Use the quadratic formula to solve. Express your answer in simplest form.

$$20a^2 - 7a - 6 = 0$$

$$\boxed{a = \frac{3}{4}, \quad a = -\frac{2}{5}}$$

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70. Solve the equation for all real solutions in simplest form.

$$5q^2 - 19q + 15 = 0$$

$$q = \frac{19 \pm \sqrt{61}}{10}$$

71. Solve the equation for all real solutions in simplest form.

$$3c^2 + 18c + 11 = 5c$$

$$c = \frac{-13 \pm \sqrt{37}}{6}$$

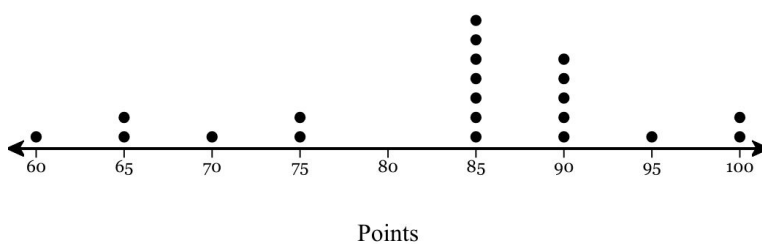
72. Solve the equation for all real solutions in simplest form.

$$4w^2 + 11w + 3 = w^2$$

$$w = \frac{-11 \pm \sqrt{85}}{6}$$

73. A teacher put all her students' quiz scores up on the dot plot below.

QUIZ SCORES

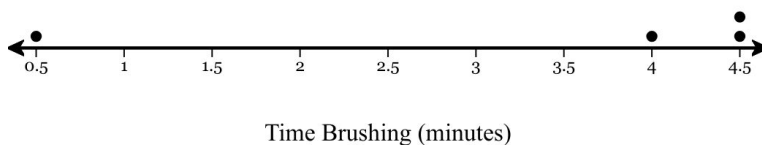


How many students scored 70?

1 student

74. The students in a class collected data on the number of minutes some of them spend brushing their teeth every day. That data is shown in the dot plot below.

BRUSHING TEETH

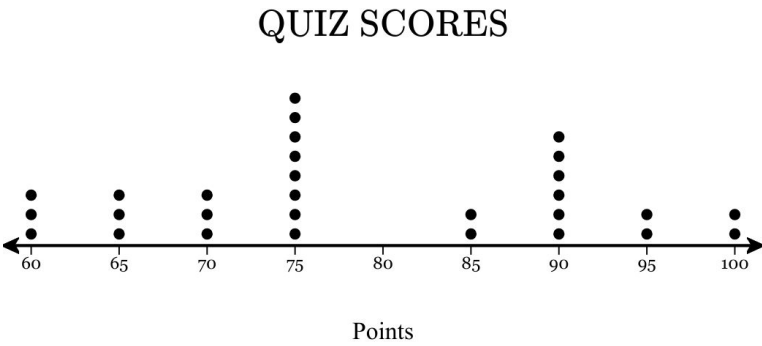


How many students were surveyed?

4 students

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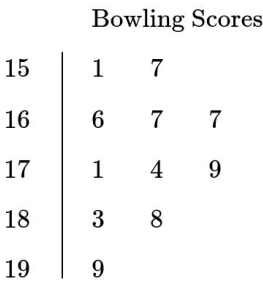
75. A teacher put all her students' quiz scores up on the dot plot below.



How many students scored less than 75?

9 students

76. Each member of a bowling team bowled a game. Their scores are shown in the stem-and-leaf plot below.



Key: 15 | 1 = 151 points

What was the most common score?

167 points

77. A coach put all of their players' 40-yard dash times in the stem-and-leaf plot below.

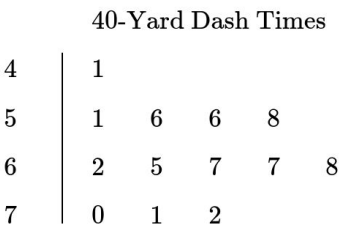


Key: 4 | 1 = 4.1 seconds

What was the median time?

6.4 seconds

78. A coach put all of their players' 40-yard dash times in the stem-and-leaf plot below.



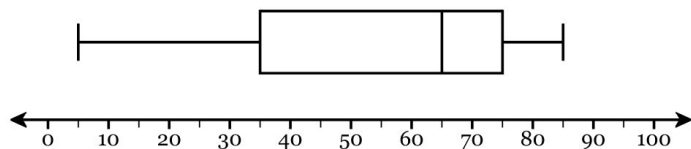
Key: 4 | 1 = 4.1 seconds

How many players are on the team?

13 players

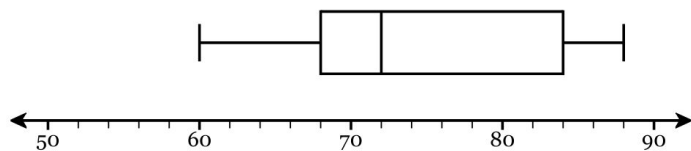
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79. The box-and-whisker plot below represents some data set. What percentage of the data values are between 35 and 75?



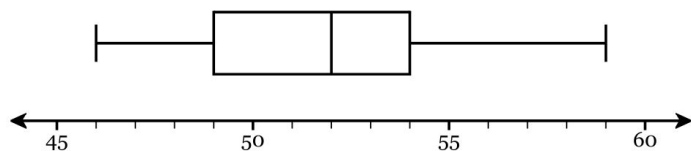
50

80. The box-and-whisker plot below represents some data set. What is the maximum value of the data?



88

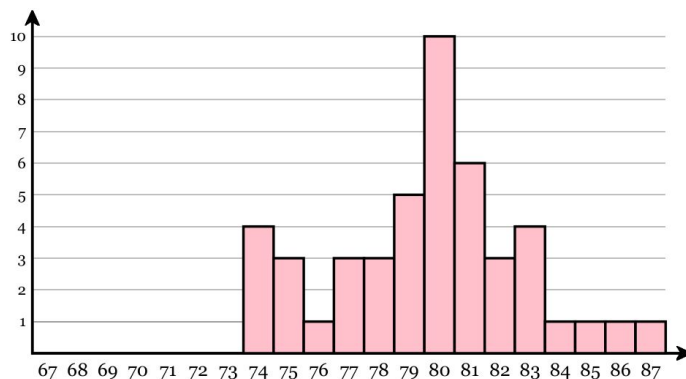
81. The box-and-whisker plot below represents some data set. What is the value of the third quartile?



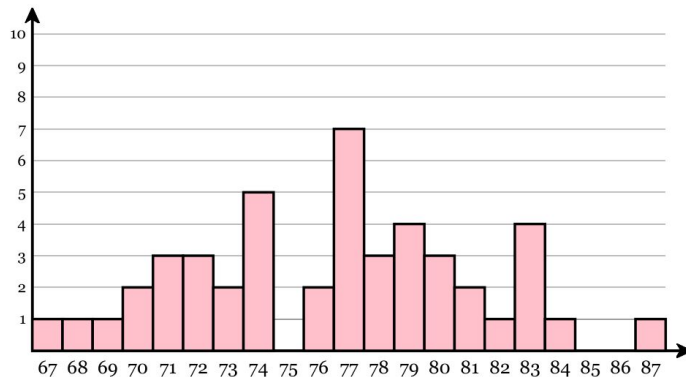
54

82. Based on the two data sets represented below, complete the following sentences.

DATA SET R



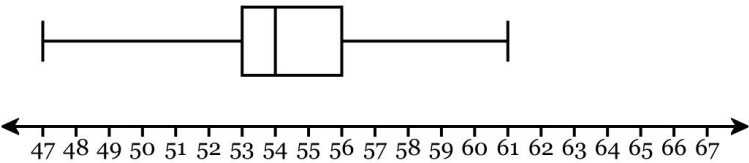
DATA SET S



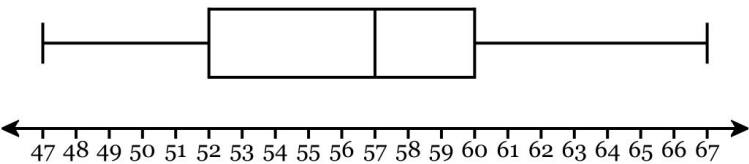
The center of Data Set R is greater than the center of Data Set S. The spread of Data Set R is less than the spread of Data Set S.

83. Based on the two data sets represented below, complete the following sentences.

DATA SET C



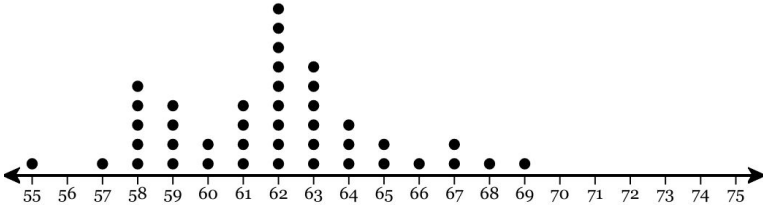
DATA SET D



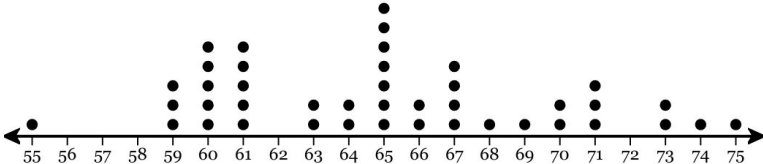
The center of Data Set C is less than the center of Data Set D.
The spread of Data Set C is less than the spread of Data Set D.

84. Based on the two data sets represented below, complete the following sentences.

DATA SET G



DATA SET H



The center of Data Set G is less than the center of Data Set H.
The spread of Data Set G is less than the spread of Data Set H.



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