

8th - Take Home Worksheet

-----Day 1-----

Select and perform an operation to answer the question.

1. What is the difference of -9 and -3 ?

2. What is the quotient of $\frac{3}{4}$ and $-\frac{1}{2}$?

Evaluate.

3. $-5^3 + 1$

4. $6^2 + (8 \div 4)(3)$

5. $x^3 + x^2 + x$ when $x = -3$

6. $3xy + xy - 4xy$ when $x = -1$ and $y = 1$

Simplify.

7. $x^3 + x^2 + x$

Solve.

8. $7y - 14 = -7y + 14$

9. $1.5x + 4.5 = x - 0.5$

10. $\frac{1}{2}(4x + 8) = -4$

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11. $-3(x-2) = 5(2x+1)$

12. $|x-5| = 8$

13. $|2x+7| = 1$

14. $x+y = 2$
 $3x-2y = 6$

15. $y = 3x$
 $x+y = 12$

16.

$$5x - 2y = 30$$

$$x + 2y = 6$$

Solve the equation for y .

17. $2x - y = -4$

18. $x + \frac{1}{2}y = -\frac{1}{3}$

19. $4x - 5xy = 7$

20. $x^2 + y = -4$

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-----Day 2-----

Solve the inequality. Then graph your solution.

21. $4x - 7 \leq -11$

22. $6 - 2x > -x$

23. $-4 < x - 1 < 2$

24. $10 < -2x$ or $2x \geq 0$

25. The formula for the perimeter of a rectangle is $P = 2l + 2w$. Solve the formula for w . What is the width of a rectangle with a perimeter of 30 meters and a length of 8 meters?

26. **Golf** Par on the golf course is 72. You played six rounds of golf last week. Your scores were 72, 74, 70, 69, 80, and 75. How many shots were you over par for the week?

27. **Numbers** Five times a number is greater than the number decreased by 12. Write these numbers as an inequality.

28. Find the range of the relation $\{(-1, 0), (3, 5), (-2, -2)\}$.

29. Find the range of the relation $\{(-4, 5), (3, -2), (-1, -1)\}$.

- a. $\{5, -2, -1\}$
- b. $\{-4, 3, -1\}$
- c. $\{4, -3, 1\}$
- d. $\{-5, 2, 1\}$

30.

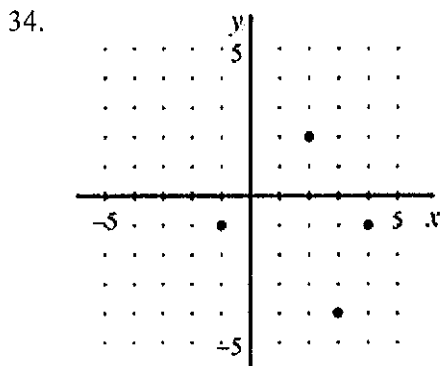
Is the relation $\{(-5, -6), (-5, -3), (-3, -2)\}$ a function?

31. Determine whether the relation is a function.
 (0, 4), (1, 4), (2, 5), (3, 6), (4, 6)

32. Determine whether the relation is a function.
 (4, 0), (4, 1), (5, 2), (6, 3), (6, 4)

33. Determine whether the relation is a function.
 (-3, 3), (-2, 2), (-1, 1), (1, -1), (2, -2), (3, -3)

Use the vertical line test to determine if the graph represents y as a function of x .



Tell whether the function is linear. Then evaluate the function when $x = -6$.

35. $f(x) = 3x + 4$

36. $f(x) = x^3 - 7$

37. $f(x) = 4 + x$

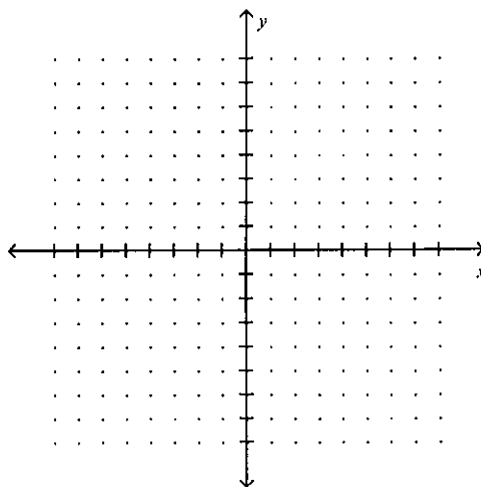
Graph the linear system and tell how many solutions it has. If there is exactly one solution, estimate the solution and check it algebraically.

38. $x + y = 4$
 $x - y = 2$

Graph the system of linear inequalities.

39. $x > 3$
 $y \leq 2$

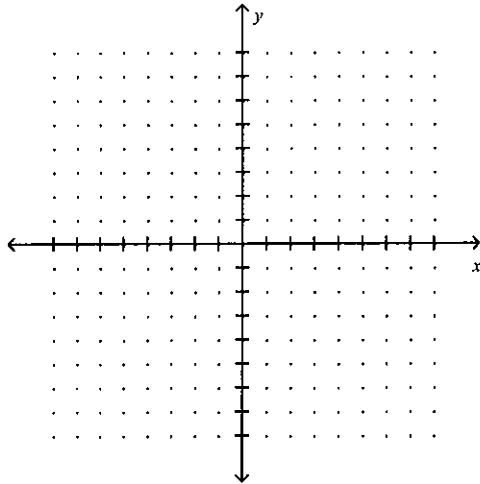
40.
 $-x + y \leq 2$
 $x \geq 0$
 $y \geq 4$



-----Day 3-----

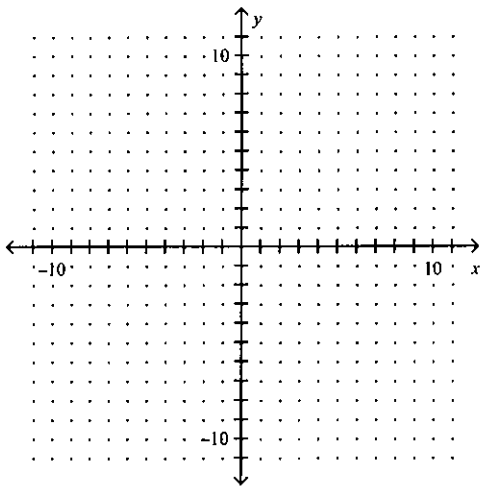
Graph.

41. $y = x^2 - 4$



42. Graph the quadratic function. Label the vertex and axis of symmetry.

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



43. Find the *vertex* and the *axis of symmetry* of the parabola. $y = -3x^2 + 12x - 8$

44.

Find the *vertex* of the parabola and determine if it opens *up* or *down*. $y = 7 - 8x - 2x^2$

45. Find the *vertex* and the *axis of symmetry* of the parabola. $y = 3x^2 + 12x + 9$

46. Does the parabola open *up* or *down*?
 $y = 4 + 6x - 2x^2$

47. Does the parabola open *up* or *down*?
 $y = -7 - 5x + 3x^2$

Simplify the expression. Give your answer in exponential form.

48. $(7^3 \cdot 8^6)^6$

a. 56^{54}

b. $7^9 \cdot 8^{12}$

c. 56^{15}

d. $7^{18} \cdot 8^{36}$

49. $6^{11} \div 6^2$

Simplify the expression.

50. $(ab)^6$

a. a^7b^7

b. a^6b^6

c. a^6b

d. a^7b^6

51. $(-3c^3d^4e^6)^2$
 a. $-9c^6d^8e^{12}$
 b. $9c^5d^6e^8$
 c. $-9c^5d^6e^8$
 d. $9c^6d^8e^{12}$

52. $\left(\frac{m^6}{n^3}\right)^6$
 a. $\frac{m^{36}}{n^3}$
 b. $\frac{m^{12}}{n^3}$
 c. $\frac{m^{36}}{n^{18}}$
 d. $\frac{m^{12}}{n^9}$

53. $\left(\frac{y^2}{z^4}\right)^5$
 a. $y^{10} + z^{20}$
 b. $\frac{y^7}{z^9}$
 c. $\frac{y^{10}}{z^4}$
 d. $\frac{y^{10}}{z^{20}}$

54. $3b^2 \cdot 4b$

55.

$(bc^3)^4$

56. $(3uv^5w)^4$

57. $(-3x^{-2})^3$

58. $(-2x^{-3})^2$

59. $(-3x^{-2})^{-3}$

60. $\left(\frac{v^7}{w^6}\right)^5$

61.

-----Day 4-----

$$\frac{6x^2}{y^3} \cdot \frac{y^{-2}x^3}{9x^2}$$

62.

$$\frac{4x^3}{y^2} \cdot \frac{y^{-3}x^{-2}}{8x^{-1}}$$

63.

$$\frac{12x^{-3}}{y^4} \cdot \frac{(y^{-2}x^2)^{-1}}{15x^{-2}}$$

64.

$$(5^5 \cdot 7^3)^2$$

Write the number in scientific notation.

65. A virus takes up a volume of approximately 0.000000000000067 cubic centimeter.
-

Simplify the expression.

66. $\sqrt{72}$

67. $2\sqrt{605} \cdot \sqrt{55}$

- a. $110\sqrt{11}$
 b. $18\sqrt{5}$
 c. $115\sqrt{5}$
 d. $55\sqrt{11}$

68.

-----Day 7-----

$$\frac{\sqrt{7260}}{\sqrt{3960}}$$

- a. $\frac{11\sqrt{60}}{6\sqrt{110}}$
 b. $\frac{110\sqrt{66}}{6}$
 c. $\frac{\sqrt{66}}{6}$
 d. $\frac{11\sqrt{10}}{\sqrt{110}}$

Solve for x.

69. $3x^2 = 147$
 a. ± 21
 b. $\pm\sqrt{144}$
 c. $\pm\sqrt{441}$
 d. ± 7

Solve.

70. $3x^2 - 9 = 3$

71. $8x^2 + 23 = 823$

- a. no real-number solution
- b. $\pm\sqrt{800}$
- c. $\pm\sqrt{64}$
- d. ± 10

72. $-3(x+9)^2 = -63$

73. $3(x-8)^2 - 29 = 37$

- a. $-8 \pm \sqrt{22}$
- b. $-66 \pm \sqrt{3}$
- c. $8 \pm \sqrt{22}$
- d. $66 \pm \sqrt{3}$

74. $3(x+7)^2 + 17 = 59$

- a. $-7 \pm \sqrt{13}$
- b. $42 \pm \sqrt{14}$
- c. $42 \pm \sqrt{13}$
- d. $-7 \pm \sqrt{14}$

75. Solve the equation. $-x^2 + 4 = 2x^2 - 5$

76. Solve the equation. $x^2 - 7 = 14 - 2x^2$

77. Solve the equation. $\frac{1}{3}x^2 + 1 = 33$

78. Solve the equation. Round the solutions to two decimal places. $5x^2 - 2 = 7$

79. Solve the equation. Round the solutions to two decimal places. $7x^2 - 2 = 23$

80. The height, h (in feet), of a falling object on Mars is given by $h = -6t^2 + s$, where t is the time in seconds and s is the initial height in feet. If an object were dropped from a height of 237 feet, how long would it take to travel half the distance to the ground? (Round to two decimal places.)

81. -----Day 5-----

The height, h (in feet), of a falling object on Mars is given by $h = -6t^2 + s$, where t is the time in seconds and s is the initial height in feet. If an object were dropped from a height of 125 feet, how long would it take to reach the ground? (Round to two decimal places.)

Decide whether the function is a polynomial function. If so, state its degree, type, and leading coefficient.

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

83. $f(x) = x^4 - x^2 + 3x - 7$

84. $g(x) = 4x^2 - x - 1$

85. Evaluate the polynomial function when $y = 5$:

$f(y) = 8y^3 - 2y^2 - 3y - 5$

Find the sum or difference.

86. $(5h^3 + 8h - 9) - (6h^3 + 6h - 4)$

a. $-h^3 + 2h - 5$

b. $-h^3 + 2h - 13$

c. $-h^3 + 14h - 13$

d. $-h^3 - 2h - 5$

87. $(6q^5 + 8q^2 + 3) + (8q^5 - 3q - 7)$

a. $-2q^5 + 8q^2 - 3q + 10$

b. $14q^5 + 8q^2 - 3q - 4$

c. $-2q^5 + 8q^2 + 3q + 10$

d. $14q^5 + 5q^2 - 4$

88. $(-7x^2 + 3) + (4x^2 + 2x - 1)$

89.

$(3x + 7) - (5x^2 - 6x + 2)$

90. $(2x + 5) - (3x^2 + 7x - 5)$

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91. $(-8s^2 - 7s) - (-9s - 1 - 2s^2)$

Find the product.

92. $(u + 4)(u^2 - 3u + 3)$

a. $u^3 + u^2 + 15u + 12$

b. $u^3 - 3u^2 + 12$

c. $u^3 + u^2 - 9u + 12$

d. $u^3 + 7u^2 - 9u + 12$

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

94. $(3x + 2)(2x^2 - 7x - 4)$

95. $(4x - 1)(3x^2 - 2x - 4)$

96. $(x + 1)(2x - 1)(x + 3)$

97. Find the missing term: $(x + 3)^2 = x^2 + 6x + \underline{\hspace{2cm}}$.

a. 12

b. 3

c. 6

d. 9

98. A rectangle has a length of $x - 6$ and a width of $x - 7$. Which equation below describes the perimeter, P , of the rectangle in terms of x ?

a. $P = 2x - 13$

b. $P = 4x - 26$

c. $P = x^2 - 13x + 42$

d. $P = x - 13$

99. Find the missing term: $(x + 2)^2 = x^2 + 4x + \underline{\hspace{2cm}}$.

Factor the polynomial completely.

100. $9y^2 - 64$

a. $(9y + 1)(y - 64)$

b. $(3y - 8)(3y - 8)$

c. $(3y + 8)(3y - 8)$

d. $(3y + 8)(3y + 8)$

101. -----Day 6-----

$$5x^3 + 5x^2 + 30x$$

a. $5x(x+1)(x+6)$

b. $5(x^3 + x^2 + 6x)$

c. $5x(x^2 + x + 6)$

d. $x(5x^2 + 5x + 30)$

102.

$$12x^4 - 42x^6$$

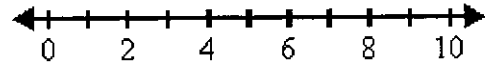
103. $4x^3 - 8x^2 + 3x - 6$

104. $2x^3 - 3x^2 + 4x - 6$

105. $x^8 - 81$

Solve and graph.

106. $12a > 78$

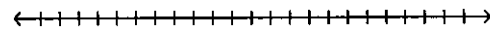


107. Solve the inequality. Graph your solution. $8x < 24$

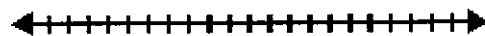
108. Solve the inequality. Graph your solution. $-3x < -12$

Solve the inequality. Then graph its solution.

109. $-\frac{x}{3} \leq -2$



110. $\frac{m}{4} \leq -3$



Solve the inequality.

111. $\frac{1}{5}x < -8$

112. $-\frac{1}{7}x \geq \frac{3}{14}$

Solve.

113. $-5x + 5 > 25$
- $x > 25$
 - $x < -4$
 - $x > -4$
 - $x < 25$

114. $13b - 6 \leq 14b + 8$

- $b \geq 2$
- $b \geq -14$
- $b \leq 14$
- $b = 2$

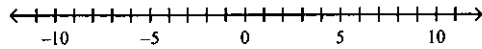
115. $-5x - 20 < 10$

116. _____

$8b - 9 \leq 9b + 2$

Solve the inequality.

117. $4x - 3 \geq 3(x + 2)$. Graph your solution.



118. Joel sells ice cream cones at the county fair. He has to rent the equipment for \$36 and spend \$0.52 on ingredients for each cone. What is the minimum number of ice cream cones Joel must sell at \$1.40 each in order to make a profit?
- 41
 - 39
 - 42
 - 40

119. Solve the inequality $4 - 3x \geq x + 3$.

120. Solve the inequality $2 - \frac{1}{3}x > 3$.

121. -----Day 7-----

Solve the inequality $2x + 4 > 1 - 2x$.

122. Solve the equation $|x| = -4$

- a. no solution
- b. -2
- c. 2
- d. 4

Solve.123. $|x - 4| = 9$

- a. The solutions are 5 and -13 .
- b. The solution is -5 .
- c. The solutions are 13 and -5 .
- d. The solution is -13 .

124. $|4x + 2| = 3$

- a. $\frac{1}{4}, -\frac{5}{4}$
- b. $-\frac{1}{4}, -\frac{5}{4}$
- c. $-\frac{1}{4}, \frac{3}{4}$
- d. $-2, \frac{3}{4}$

125. $|x + 6| = 3$

126. $5 = |-4 + 5x|$

Solve the equation algebraically.127. $|x - 2| - 2 = 7$

128. $15 - |x| = 7$

129. $3 + |x - 3| = 7$

Solve the inequality.130. $|-3x - 7| + 4 < 3$

Simplify. Leave your answer in exponential form.

131. $8^1 \times 8^6$
 a. 8^6
 b. 64^7
 c. 8^5
 d. 8^7

Simplify:

132. $r^4 \cdot r^5 \cdot r^6$
 a. r^{120}
 b. $3r^{120}$
 c. r^{15}
 d. $3r^{15}$
133. $(wc^7)(-8w^3c^5)$
 a. $-8w^4c^{12}$
 b. $-8w^3c^{12}$
 c. $-8w^4c^{11}$
 d. $-8w^3c^{11}$
134. $(-3c^8)(2c^6d^8)$
 a. $-6c^{14}d^8$
 b. $-6c^{48}d^8$
 c. $6c^{48}d^{14}$
 d. $6c^{14}d^{14}$
135. $(g^7)^6$
 a. g^{42}
 b. g^{13}
 c. g^{67}
 d. $g^{7/6}$
136. $d \cdot d^9 \cdot d^6$
-

137. $(3c^2)(-3c^2d^2)$

Simplify. Write your answer using exponents.

138. $(8^8)^8$
 a. 8^{128}
 b. 8^{16}
 c. 8^{64}
 d. 64^8
139. $(2^2)^6$
 a. $2^{1/3}$
 b. 2^{64}
 c. 2^8
 d. 2^{12}
- 140.

$(4t^2r^4)^3$
 a. $64t^6r^{12}$
 b. $-64t^6r^{12}$
 c. $-64t^5r^7$
 d. $12t^5r^7$

141. -----Day 8-----

Simplify: $(2v)^2$

Simplify:

142. $(-3t^5r^8)^4$

143. Simplify $(8x^3)^2(2x^2)^3$.

144. Simplify $(2x)^4(3x^3)^2$.

145. Simplify $(-x)^2(-x^2)^2(-x^3)$.

146. Write 0.000732 in scientific notation.

- a. 732×10^{-6}
- b. 732×10^{-5}
- c. 0.732×10^{-3}
- d. 7.32×10^{-4}

Multiply:

147. $(3.5 \times 10^{-8})(8.2 \times 10^2)$

- a. 28.7×10^{-6}
- b. 11.7×10^{-6}
- c. 2.87×10^{-6}
- d. 28.7×10^{-16}

148. In astronomy, the immense distances between celestial bodies are measured in light-years, the distance that light can travel in one year. One light-year is approximately 5,880,000,000,000 miles. If a star is 8.4 light-years from Earth, how would you correctly represent the number of miles the star is from Earth in scientific notation?

- a. 49.4×10^{12}
- b. 4.8×10^{13}
- c. 4.9×10^{13}
- d. 5.9×10^{12}

149. Ordinary conversation with another person typically has an intensity level of 65 decibels, which is equivalent to a power intensity of about 32 ten-millionths of a watt per square meter. How would you correctly represent the number 32 ten-millionths in scientific notation?

- a. 3.2×10^{-7}
- b. 32×10^{-8}
- c. 3.2×10^{-5}
- d. 3.2×10^{-6}

150. The calorie and the BTU (British Thermal Unit) are two standard units of energy. Two calories is about 0.007936 BTU. How is this measure expressed in scientific notation?

- a. 7.936×10^3
- b. 7.936×10^{-3}
- c. 79.36×10^4
- d. 79.36×10^{-4}

151.

Deimos, a moon of Mars, takes about 1860 minutes to orbit the Mars. How is this measurement expressed in scientific notation?

- a. 18.6×10^1 minutes
- b. 1.86×10^4 minutes
- c. 18.6×10^2 minutes
- d. 1.86×10^3 minutes

152.

Evaluate $49.5 \cdot (10^4)$.

- a. 495,000
- b. 4950
- c. 49,500
- d. 4,950,000

153. Radio signals travel at a rate of 3.00×10^8 meters per second. How many seconds will it take for a radio signal to travel from a satellite to the surface of Earth if the satellite is orbiting at a height of 9.90×10^7 meters?

- a. 2.97 seconds
- b. 0.330 seconds
- c. 29.7 seconds
- d. 0.0330 seconds

154. Which list shows the numbers in order from **least** to **greatest**?

- a. 3.5×10^{-2} , 3.5×10^{-3} , 5.3×10^{-3}
- b. 3.5×10^{-3} , 3.5×10^{-2} , 5.3×10^{-3}
- c. 3.5×10^{-3} , 5.3×10^{-3} , 3.5×10^{-2}
- d. 5.3×10^{-3} , 3.5×10^{-3} , 3.5×10^{-2}

155.

Sometimes it is easier to understand the size of a number given in scientific notation if it is converted to fraction form. What simplified fraction is equivalent to 3.50×10^{-2} ?

156. Write 732,000 in scientific notation.

157. Rewrite 50,800,000 in scientific notation.

158. Rewrite 0.00000428 in scientific notation.

159. Rewrite 0.000000000193 in scientific notation.

160. Rewrite 3.15×10^{-8} in standard form.

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161.

-----Day 9-----

Rewrite 3.94×10^9 in standard form.

162. Rewrite 2.13×10^{-8} in standard form.

163. Evaluate $(2.71 \times 10^{-3})^2$ and write the result in both standard form and scientific notation.

164. Evaluate $(6.19 \times 10^{-2})^2$ and write the result in both standard form and scientific notation.

165. Evaluate $(8.3 \times 10^{-5})(2 \times 10^{12})$. Write the result in standard form.

166. Evaluate $(7 \times 10^{-3}) \cdot (4 \times 10^5)$. Write the result in standard form.

167. Evaluate $(7 \times 10^7) \cdot (5 \times 10^{-6})$. Write the result in standard form.

168. Evaluate. Express the product in scientific notation.
 $(3.1 \times 10^2)(1.2 \times 10^3)$

169. Divide by first writing each number in scientific notation form. Write the answer in scientific notation form. $\frac{3500}{0.005}$

170. Last year a large trucking company delivered about 5 million loads of goods at an average value of \$12,500 per load. What was the total value of goods delivered? Express your answer in scientific notation.

Give answers to one decimal place where needed.

171. 3.1×10^{-3} is what percent of 8.75×10^{-2} ?

172. The radius of the earth is about 6.37×10^6 meters. If a satellite's altitude is 240 kilometers, or 2.40×10^5 meters, above the surface of the earth, what is the satellite's distance from the center of the earth? Give your answer using scientific notation.

173. Earth's radius is about six million three hundred seventy thousand meters. Write this distance using scientific notation.

174. A common thickness for aluminum foil is 4.5×10^{-3} inch. Write the word form of this thickness.

175. **Writing:** Explain what scientific notation is and why it is useful. Give examples to illustrate your explanation.

176. **Writing:** During a recent flight, one of the space shuttles traveled 3.5×10^6 mi. The total cost of the flight was $\$7 \times 10^7$. Explain how to find the cost per mile traveled using the numbers in their given form. Include the process for finding the answer and the answer in your explanation.

177. Sally wants to plant some flowers in a cube-shaped planter box. If one edge of the box measures 10 inches, how much soil will be needed to fill the planter?

a. 1000 in.^3
b. 100 in.^3
c. 333 in.^3
d. 600 in.^3

178. To find the mileage, or how many miles per gallon a car can travel, you can use the expression $\frac{m}{g}$, where m is the distance in miles and g is the number of gallons of gas used. Find the mileage for a car that travels 350 miles on 14 gallons of gas.

179. Evaluate the expression x^3 when $x = 6$.

Simplify:

180. $3 + 3(3 + 4)^3$

a. 1032
b. 9264
c. 2058
d. 91

181.

-----Day 10-----

Evaluate $\frac{qr}{q+r}$ when $q = 8$ and $r = 13$.

- a. 1
 b. $\frac{104}{21}$
 c. $\frac{813}{21}$
 d. $\frac{39}{7}$

182. Simplify $7 \times 7 + 15 - 6 \div 2$.

- a. 50
 b. 61
 c. 53.5
 d. 29

183. Evaluate the expression $n \times 3 + 27 \div 3$, given $n = 3$.

- a. 12
 b. 36
 c. 18
 d. 30

184. Simplify $(7 \cdot 6^2 - 7 \cdot 3^2) \div (4 + 3)$.

- a. 27
 b. 243
 c. 189
 d. 261

185. Evaluate the expression $8.2x - 6.1$ when $x = 7$.

186. Order the numbers from least to greatest.

$$\frac{3}{2}, -10, 0, \frac{2}{3}, -\frac{5}{4}, 1$$

187. Write the numbers in *decreasing* order.

$$-\frac{3}{2}, 0, \frac{2}{3}, -\frac{2}{3}, -\frac{5}{2}, \frac{1}{5}$$

188. What is the opposite of 16?

Evaluate.189. $-(-4) - (-5) + 6$

- a. 3
 b. -3
 c. 5
 d. 15

190. On Monday, Kevin wrote a check for \$575 to pay his rent. On Tuesday, he deposited a tax refund check for \$638. On Friday, he wrote checks for \$75 for groceries and \$266 for a car repair. Which integer represents the overall change in his checking account balance for the week, in dollars?

- a. -278
 b. -916
 c. -1554
 d. -178

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191. Simplify the expression $(-7) + 6 + [-(2 - 3)]$.

192. Evaluate the expression $28 - (-x) - |10|$ when $x = -15$.

193. Evaluate the expression $17 - (-x) - |-10|$ when $x = 3$.

194. What is the mean of the data?

$-37, -39, -18, 22, 24, -36, -31, 35$

a. -10

b. -39

c. 0

d. -24.5

A student measured the temperature in degrees Celsius for several winter days and recorded the data in a list. Find the mean of the temperatures listed.

195. $-10^\circ, -10^\circ, -7^\circ, -12^\circ, 8^\circ, 1^\circ, -5^\circ, -5^\circ$

a. -5°C

b. -12°C

c. 0°C

d. -6°C

196. Dividing by 3 is the same as multiplying by what fraction?

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

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

c. 4

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

197. Evaluate $\frac{x}{y}$ when $x = 40$ and $y = -8$.

198. Simplify the expression $\frac{15d+24}{3}$.

199. Simplify the expression $\frac{28x-14}{7}$.

200. Simplify the expression $\frac{30-18x}{6}$.
