

Given $f: x \rightarrow 5 - 3x$, find the following values of f . (8-7)

75. $f(4)$ 76. $f\left(-\frac{1}{3}\right)$ 77. $f(0)$ 78. $f(-5)$

Given $G(n) = n^3 + 2n$, find the following values of G . (8-7)

79. $G(0)$ 80. $G(-2)$ 81. $G\left(\frac{1}{2}\right)$ 82. $G(3)$

Find all the values of each function. (8-7)

83. $h(x) = 5 - 2x - x^2$, $D = \{1, 2, 3\}$ 84. $M(u) = \frac{6}{4u+2}$, $D = \{-1, 0, 1\}$

Find the range of each function. (8-7)

85. $r: z \rightarrow -3 - 4z$, $D = \{-2, -1, 0\}$ 86. $N: s \rightarrow \frac{10}{s-3}$, $D = \{2, 4, 8\}$
87. $G: w \rightarrow (w-1)(w+1)$, $D = \{-2, 0, 2\}$ 88. $k: v \rightarrow v^2 - 4v + 2$, $D = \{3, 4, 5\}$

Find the vertex and the axis of symmetry of the graph of each equation. (8-8)
Use the vertex and at least four other points to graph the equation.

89. $y = 4x^2$ 90. $y = -2x^2$ 91. $y = \frac{1}{5}x^2$
92. $y = -x^2 + 3x$ 93. $y = x^2 - 2x + 5$ 94. $y = 4 - \frac{1}{2}x^2$

Find the vertex. Then give the least value of the function. (8-8)

95. $f: x \rightarrow x^2 + 7x$ 96. $g: x \rightarrow x^2 - 3x - 4$ 97. $h: x \rightarrow \frac{1}{2}x^2$

Find the vertex. Then give the greatest value of the function. (8-8)

98. $f(x) = x - 3x^2$ 99. $g(x) = 2 - \frac{1}{3}x^2$ 100. $h(x) = -x^2 - x - 1$

In Exercises 101 and 102, find the constant of variation. (8-9)

101. y varies directly as x , and $y = 12$ when $x = 60$.
102. q is directly proportional to p , and $q = 144$ when $p = 24$.
103. If n varies directly as m , and $n = 300$ when $m = 5$, find n when $m = 15$.
104. If b is directly proportional to a , and $b = 28.7$ when $a = 4.1$, find b when $a = 13$.

(x_1, y_1) and (x_2, y_2) are ordered pairs of the same direct variation. (8-9)
Find each missing value.

105. $x_1 = 35, y_1 = 7$ 106. $x_1 = 5.2, y_1 = 5$ 107. $x_1 = \frac{3}{8}, y_1 = \frac{?}{?}$
 $x_2 = 105, y_2 = \frac{?}{?}$ $x_2 = \frac{?}{?}, y_2 = 1$ $x_2 = \frac{2}{5}, y_2 = \frac{1}{10}$

For each variation described, state (a) a formula and (b) a proportion.

(8-9, 8-10)

108. The circumference, C , of a circle is directly proportional to the diameter, d , of the circle.
109. The elongation, e , of a coil spring varies directly as the mass, m , suspended from it.
110. The length, l , of the shadow of a vertical object at a given time and location varies directly with the height, h , of the object.
111. The monthly rent, r , for each roommate in an apartment is inversely proportional to the number, n , of roommates.
112. The height, h , of a triangle of constant area varies inversely as the base length, b .
113. The number of tickets remaining to be sold, n , varies inversely as the number of tickets sold, s .

Graph each equation if the domain and the range are both the set of non-zero real numbers.

(8-10)

114. $xy = 4$ 115. $3xy = 1$ 116. $x = \frac{10}{y}$ 117. $\frac{x}{2} = \frac{4}{y}$

(x_1, y_1) and (x_2, y_2) are ordered pairs of the same inverse variation. Find each missing value.

(8-10)

118. $x_1 = 5, y_1 = 8$
 $x_2 = 4, y_2 = ?$

119. $x_1 = 0.6, y_1 = 1.2$
 $x_2 = ?, y_2 = 0.4$

120. $x_1 = \frac{1}{4}, y_1 = ?$
 $x_2 = \frac{1}{6}, y_2 = \frac{1}{2}$

Chapter 9

Solve each system by the graphic method.

(9-1)

1. $x + y = 6$ $x - y = 2$	2. $x + y = 9$ $y = 2x$	3. $x + y = 0$ $x + 2y = 2$
4. $y = 3 - x$ $x + y = 5$	5. $y = \frac{2}{3}x + 1$ $y = -\frac{2}{3}x + 5$	6. $y = \frac{1}{2}x + 1$ $x + 2 = 2y$

Solve by the substitution method.

(9-2)

7. $3x + y = 5$ $y = 2x$	8. $m - 3n = -4$ $2m + 6n = 5$	9. $2a + b = 4$ $b = 1 - a$
10. $4c - 3d = 9$ $2c - d = 5$	11. $x + 3y = 2$ $2x + 3y = 7$	12. $3x - 2y = 5$ $x + 2y = 15$