M122 Practice Exam 1

Determine whether the given relationship defines a function.

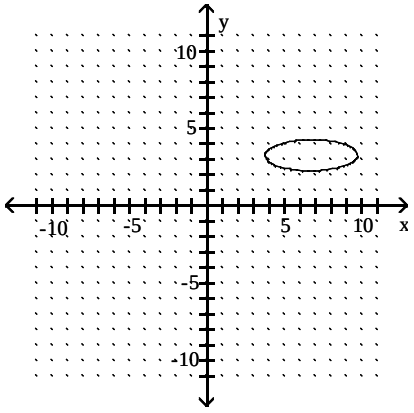
1) The height of a child at each of his annual physicals 1) _____

Evaluate the function.

2) Given $f(x) = (x + 8)^2$, find $f(-7)$. 2) _____

State whether the graph is or is not that of a function.

3) 3) _____



Decide whether or not the set of ordered pairs defines a function.

4) {(–3, –2), (–1, –5), (3, 6), (3, 8)} 4) _____

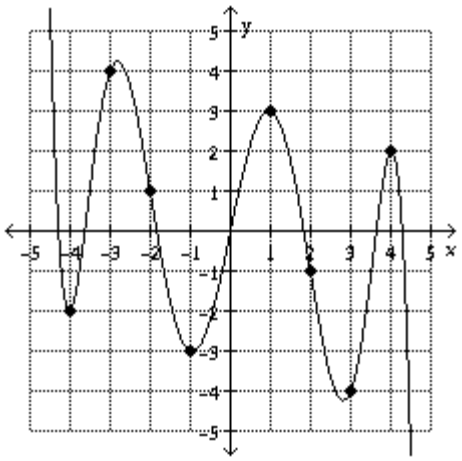
Decide whether or not the equation defines y as a function of x.

5) $y = x^2 + 7$ 5) _____

6) Employees of a publishing company received an increase in salary of 8% plus a bonus of $1200. Let $S(x) = 1.08x + 1200$ represent the new salary in terms of the previous salary x. Faind and interpret S(13000) 6) _____

Evaluate the function.

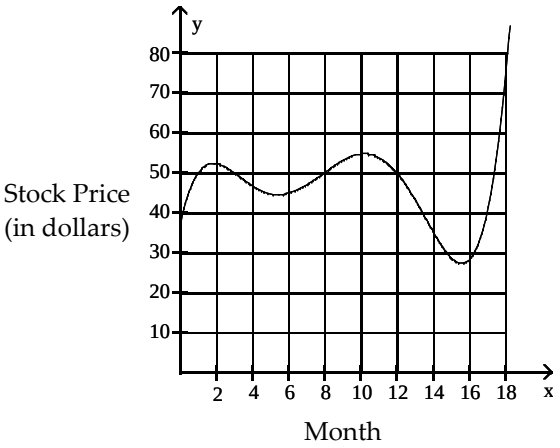
7) 7) _____



If y = f(x), find a. f(4) and find b. x when f(x) = –2.

Solve the problem.

8) The following graph shows the stock price of a new internet company over the first 18 months after the initial public offering of its stock. 8) _____



How many months was the stock price $40 during the initial 18 month period?

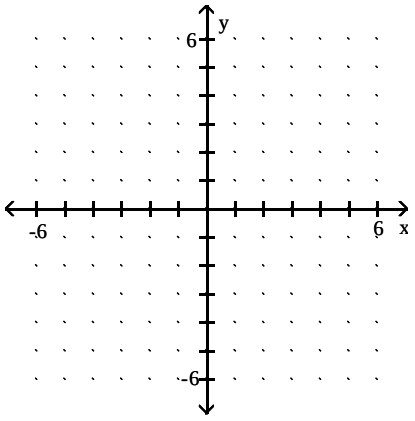
9) A boat is moving away from shore in such a way that at time t hours its distance from shore, in kilometers, is given by the linear function d(t) = 4.5t + 7.4. What is the rate of change of the distance from shore? 9) _____

10) This chart shows the fees for an 18–hole round of golf for each of the last 5 years at a local municipal golf course. Assume that this chart defines a function with the name of f. Find f(1997). 10) _____

Year	Fee
1995	$21
1996	$24
1997	$26
1998	$26
1999	$28

Graph the function with a graphing utility.

11) $y = x^3 + x^2 - 5x + 3$ 11) _____



Determine a viewing window that will provide a complete graph of the function.

12) $y = 3x^3 - 26x^2 + 18x - 47$ 12) _____

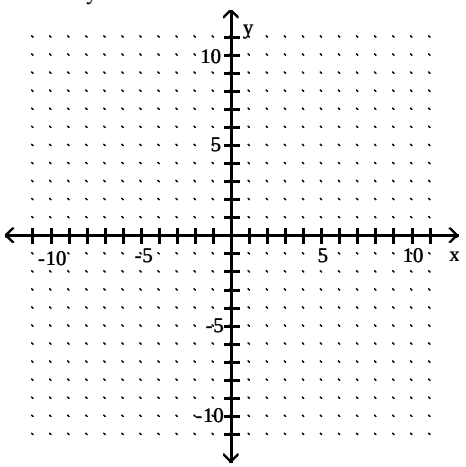
Solve the problem.

13) The polynomial $0.0035x^3 - 0.0052x^2 + 0.111x + 1.71$ gives the approximate total earnings of a company, in millions of dollars, where $x = 0$ corresponds to 1996, $x = 1$ corresponds to 1997, and so on. This model is valid for the years from 1996 to 2000. Determine the earnings for 1999. Round your answer to the nearest hundredth million. 13) _____

14) The course grade for a student is found by adding the percent grade for each of 4 tests plus twice the percent grade on the final exam, divided by 6. Create a model that gives the course grade y (as a percent) as a function of the final exam grade x (as a percent) for a student whose four test grades are 69%, 70%, 81%, and 97%. 14) _____

Find the x– and y–intercepts of the graph of the given equation, if they exist. Then graph the equation.

15) $5x - 30y = 30$ 15) _____



Write an equation of the line through the given point with the given slope. Write the equation in slope –intercept form.

16) $(3, 2)$; $m = -\frac{3}{5}$ 16) _____

Write the slope–intercept form of the equation for the line passing through the given pair of points.

17) $(2, -3)$ and $(-9, -5)$ 17) _____

Find the average rate of change for the function over the given interval.

18) $y = x^2 + 5x$ between $x = 2$ and $x = 9$ 18) _____

Solve the problem.

19) A moving firm charges a flat fee of \$35 plus \$30 per hour. Let y be the cost in dollars of using the moving firm for x hours. Find the slope–intercept form of the equation. 19) _____

20) In 1995 the United States recovered 25% of its municipal solid wastes through recycling, up from 17% in 1990. Let P represent the percentage recycled and t the number of years since 1990. Find a linear equation for P as a function of t. 20) _____

Solve the equation.

21) $8x + 4(3x - 4) = 13 - 9x$ 21) _____

Solve the equation for y.

22) $3x - 10y = -6$ 22) _____

Solve the problem.

23) Mark has \$90 to spend on salmon at \$5.00 per pound and/or chicken at \$3.00 per pound. If he buys s pounds of salmon and c pounds of chicken, the equation $5s + 3c = 90$ must be satisfied. How much salmon did Mark buy if he bought 15 pounds of chicken? 23) _____

Write the best–fit linear model for the data.

24) The paired data below consist of the temperatures on randomly chosen days and the amount a certain kind of plant grew (in millimeters). Use linear regression to find a linear function that predicts a plant's growth as a function of temperature. 24) _____

Temp	62	76	50	51	71	46	51	44	79
Growth	36	39	50	13	33	33	17	6	16

Algebraically , solve the system of equations.(if a solution exists)

25) $8x + 9y = 39$
$5x - 3y = 33$ 25) _____

To find the number of units that gives break–even for the product, solve the equation R = C. Round your answer to the nearest whole unit.

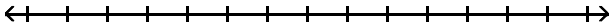
26) A manufacturer has total revenue given by the function $R = 60x$ and has total cost given by $C = 93{,}000 + 40x$, where x is the number of units produced and sold. 26) _____

Solve the problem.

27) The demand for a certain product is given by $p + 8q = 278$, and the supply is given by $p - 4q = 26$, where p is the price in dollars and q is the quantity demanded or supplied at price p. Find the price at which the quantity demanded equals the quantity supplied. 27) _____

Solve the inequality and draw a number line graph of the solution.

28) $-6z + 6 \geq -7z + 4$ 28) _____



29) Solve $-7x + 8 < 50$ 29) _____

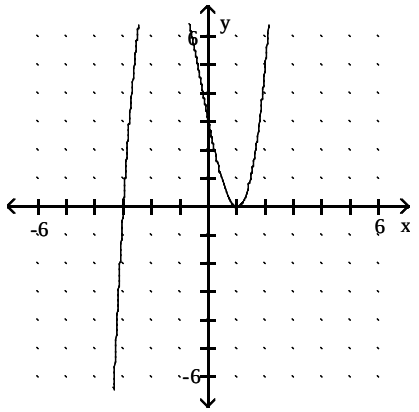
Solve the problem.

30) The equation $y = 0.003x - 0.20$ can be used to determine the approximate profit, y in dollars, of producing x items. How many items must be produced so the profit will be at least \$2361? 30) _____

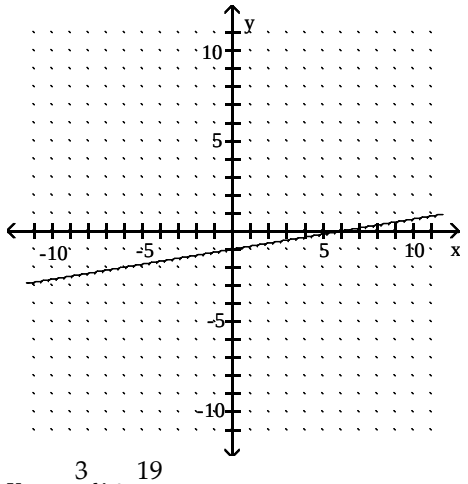
Solve.

31) Using the formula to find Fahrenheit (F) in terms of Celsius (C), $F = \left(\frac{9}{5}\right)C + 32$, find the range (to the nearest tenth) of the Fahrenheit temperature when the range of the Celsius temperature is between $1°C$ and $6°C$, inclusive. 31) _____

1) Yes
2) 1
3) No
4) No
5) Yes
6) If the emplyees made $13,000 last year, their new salary is $15,240.
7) a. 2, b. –4or –1.5 or –0.5 or 2.1 or 3.3 or 4.4
8) 3
9) 4.5 km/hr
10) $26
11)



12) [–3, 10] by [–400, 100]
13) $2.09 million
14) $y = \frac{317 + 2x}{6}$
15) (6, 0); (0, –1)



16) $y = -\frac{3}{5}x + \frac{19}{5}$
17) $y = \frac{2}{11}x - \frac{37}{11}$
18) 16
19) y = 30x + 35
20) P = 1.60000002t + 17
21) 1

22) $y = \frac{3}{10}x + \frac{3}{5}$

23) 9 pounds

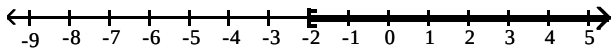
24) $y = 14.6 + 0.211x$

25) $x = 6, y = -1$

26) 4650 units

27) $110

28) $[-2, \infty)$



29) $x > -6$

30) $x \geq 787{,}067$

31) Between 33.8°F and 42.8°F, inclusive