Math 90 Chapter 8 Practice Problems   Name _____
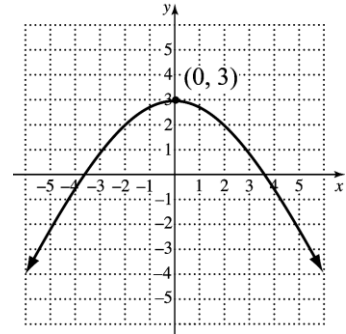
1. For the following graph of f, determine

    (a) $f(2)$;
    (b) the domain of f;
    (c) any x value for which $f(x) = 2$; and
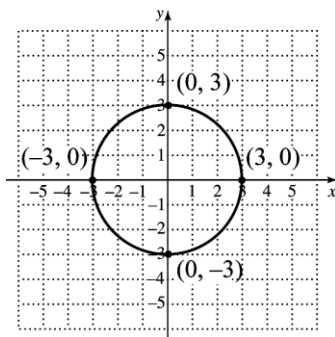   (d) the range of f.

2. In 2000, 105,000 people ate at The Loony Spoon, and 215,000 customers ate there in 2008. Estimate the number of people who ate at The Loony Spoon in 2003.
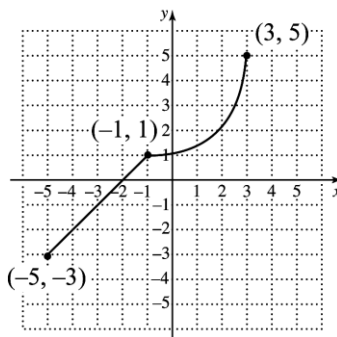
For each of the following graphs,
    (a) determine whether the graph represents a function and
    (b) if so, determine the domain and the range of the function.
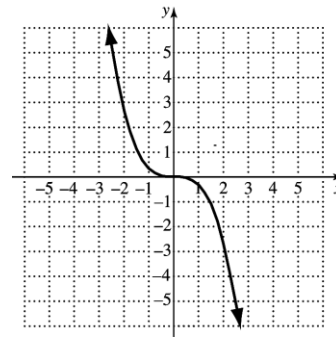
3.

4.

5.

6. The distance d, in miles, that Liam is from his parents' house in Boston is given by the function $d(t)=220-55t$, where t is the number of hours since he left his home.
   What is the domain of the function?

7. For the function given by $f(x) = \begin{cases} -x^2 + 3, & \text{for } x < -2 \\ x+4, & \text{for } -2 \le x \le 4 \\ -6, & \text{for } x > 4 \end{cases}$ find (a) $f(-2)$; (b) $f(5)$.

8. Una paid $175 for her phone. Her monthly service fee is $45. Formulate a linear function to model the cost $C(t)$ for t months of service, and determine the amount of time required for the total cost to reach $490.

9. If you rent a car for one day and drive it 100 mi, the cost is $65. If you drive it 200 mi, the cost is $105. Let $C(m)$ represent the cost, in dollars, of driving m miles.

    a) Find a linear function that fits the data.
    b) Use the function to find how much it will cost you to rent the car for one day and drive it 350 mi.

Classify each function as a linear function, a quadratic function, another polynomial function, an absolute-value function, or a rational function. Then find the domain of each function.

10. $g(x) = \dfrac{4}{x+1}$ 11. $h(x) = 5 - x^2$ 12. $f(x) = -\dfrac{1}{2}x + 3$

Graph each function and determine it domain and range.

13. f(x) = -2x + 3   14. $h(x) = 4 - x^2$ 15. f(x) = 2   26. h(x) = |2 − x|

Find the following, given $g(x) = \dfrac{-2}{x+5}$ and $h(x) = 4x + 3$

16. $h(-3)$ 17. $h(4a)$ 18. $(g+h)(x)$

19. The domain of g   20. The domain of g − h   21. The domain of g/h

22. If y varies directly as x and y = 35 when x = 4, find the equation of variation.

23. The number of workers n needed to set up for a rummage sale varies inversely as the amount of time t allowed for the set-up. If it takes 4 workers to set up if 10 hours are allowed, how many workers are needed if 8 hours are allowed?

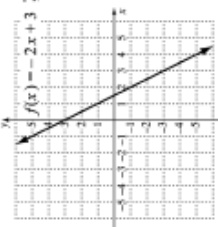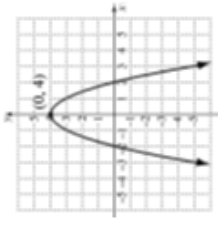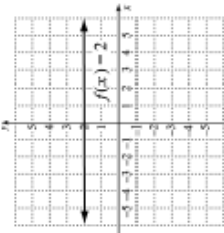24. The surface area of a balloon varies directly as the square of its radius. The area is 1256 cm² when the radius is 10 cm. What is the area when the radius is 4 cm?

25. The function f (t)=6 + 0.09t can be used to determine a marathon runner's location, in miles from the starting line, measured t minutes after passing the 6-mi mark.
a) How far from the start will the runner be 120 minutes after passing the 6-mi mark?
b) Assuming a constant rate, how fast is the runner traveling?

Answers

14.

15.
domain: ℝ;
range: {y| y ≤ 4} or (-∞, 4]

domain: ℝ; range: {2}

16. −9

17. 16a + 3

18. $\dfrac{-2}{x+5} + 4x + 3$

19. {x|x is a real number and x ≠ −5}

20. {x|x is a real number and x ≠ −5}

21. {x|x is a real number and x ≠ −5 and x ≠ −¾}

22. y = 8.75x

23. 5 workers

24. 200.96 cm²

25. a) 16.8 miles; b) 0.09 miles/min

1. a) f(2) = 2;
   b) {x|x is a real number}, or ℝ
   c) −2, 2;
   d) {y|y ≤ 3}, or (−∞, 3]

2. 146,250 people

3. a) No

4. a) Yes;
   b) Domain: {x|−5 ≤ x ≤ 3}, or [−5, 3];
   range: {y|−3 ≤ y ≤ 5}, or [−3, 5]

5. a) Yes;
   b) Domain: ℝ;
   range: ℝ

6. {t|0 ≤ t ≤ 4}

7. a) 2;
   b) −6

8. C(t) = 45t + 175; 7 months

9. a) C(m) = 0.4m + 25;
   b) $165

10. Rational function;
    {x|x is a real number and x ≠ −1}

11. Quadratic function; ℝ

12. Linear function; ℝ

13.
domain: ℝ; range: ℝ

26. Graph not given. Make sure that you check your answer with a tutor or the teacher.