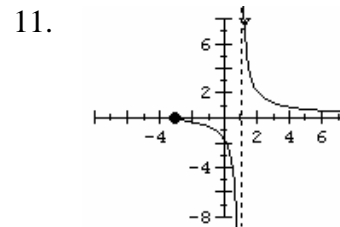
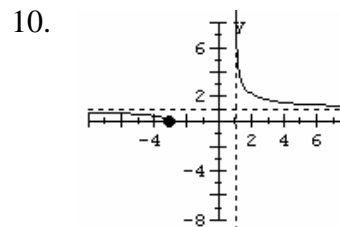
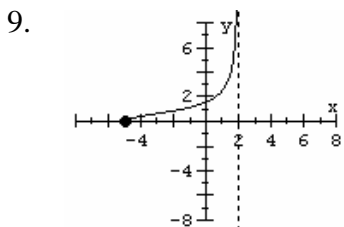
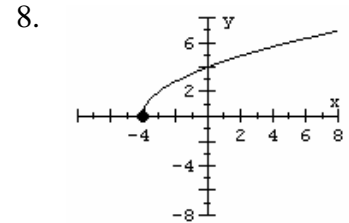
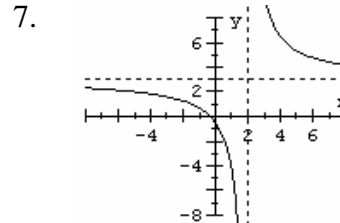
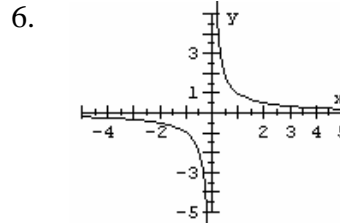
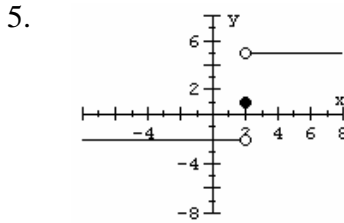
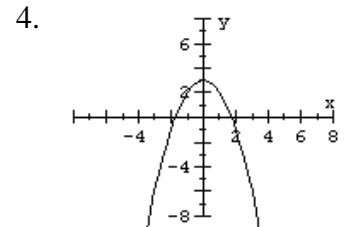
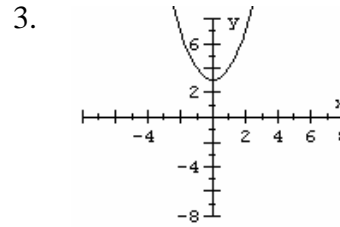
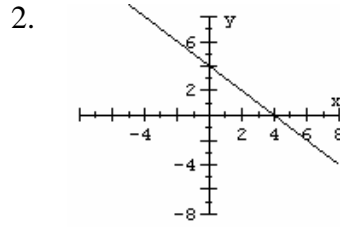
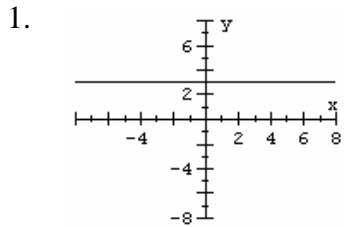


MATH121
Domain and Range—Graphically and Algebraically

In problems 1-11, find the domain and range of the function whose graph is shown.



In problems 12-21, find the domain and range.

12. $\{(3,1),(-1,5),(2,5)\}$

13. $\{(x, x^2 - 4)\}$

14. $\{(x, y) \mid y = \sqrt{x-3}\}$

15. $\{(x, 4)\}$

16. $\{(x, y) \mid y = 3 - \sqrt{x}\}$

17. $f(x) = |x+4|$

18. $f(x) = \begin{cases} 1 & \text{if } x < 0 \\ 3 & \text{if } x = 0 \\ 5 & \text{if } x > 0 \end{cases}$

19. $f(x) = \begin{cases} 2x-2 & \text{if } x < 3 \\ 7-x & \text{if } x \geq 3 \end{cases}$

20. $f(x) = \frac{x-1}{x-1}$

21. $f(x) = \frac{x^2-1}{x+1}$

In problems 22-28, find the domain.

22. $f(x) = \frac{x+5}{\sqrt{1-x}}$

25. $f(x) = \frac{\sqrt{x+2}}{x-4}$

23. $f(x) = \frac{x-4}{\sqrt{2x+6}}$

26. $f(x) = \sqrt{\frac{x+6}{2x+1}}$

24. $f(x) = \frac{\sqrt{x+4}}{x-1}$

$$27. f(x) = \sqrt{\frac{x+3}{1-x}}$$

$$28. f(x) = \sqrt{\frac{4-x}{2x+5}}$$

Answers: (Note: \mathfrak{R} is the set of real numbers so that writing $\mathfrak{R} - \{0\}$ is the same as writing $(-\infty, 0) \cup (0, \infty)$)

$$1. D = \mathfrak{R}, R = \{3\}$$

$$2. D = \mathfrak{R}, R = \mathfrak{R}$$

$$3. D = \mathfrak{R}, R = [3, \infty)$$

$$4. D = \mathfrak{R}, R = (-\infty, 3]$$

$$5. D = \mathfrak{R}, \{-2, 1, 5\}$$

$$6. D = \mathfrak{R} - \{0\}, R = \mathfrak{R} - \{0\}$$

$$7. D = \mathfrak{R} - \{2\}, R = \mathfrak{R} - \{3\}$$

$$8. D = [-4, \infty), R = [0, \infty)$$

$$9. D = [-4, 2), R = [0, \infty)$$

$$10. D = (-\infty, -4] \cup (2, \infty), R = [0, 1) \cup (1, \infty)$$

$$11. D = [-4, 1) \cup (1, \infty), R = \mathfrak{R}$$

$$12. D = \{-1, 2, 3\}, R = 1, 5$$

$$13. D = \mathfrak{R}, R = [-4, \infty)$$

$$14. D = [3, \infty), R = [0, \infty)$$

$$15. D = \mathfrak{R}, R = \{4\}$$

$$16. D = [0, \infty), R = (-\infty, 3]$$

$$17. D = \mathfrak{R}, R = [0, \infty)$$

$$18. D = \mathfrak{R}, R = \{1, 3, 5\}$$

$$19. D = \mathfrak{R}, R = (-\infty, 4]$$

$$20. D = \mathfrak{R} - \{1\}, R = \{1\}$$

$$21. D = \mathfrak{R} - \{-1\}, R = \mathfrak{R} - \{-2\}$$

$$22. D = (-\infty, 1)$$

$$23. D = (-3, \infty)$$

$$24. D = [-4, 1) \cup (1, \infty)$$

$$25. D = [-2, 4) \cup (4, \infty)$$

$$26. D = (-\infty, -6] \cup \left(-\frac{1}{2}, \infty\right)$$

$$27. D = [-3, 1)$$

$$28. D = \left(-\frac{5}{2}, 4\right]$$