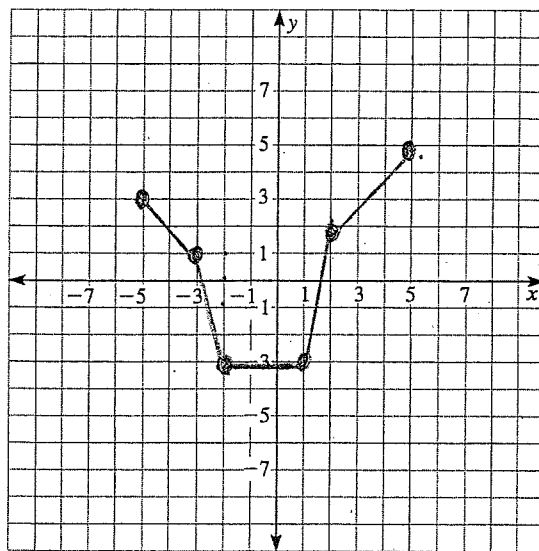


Given the graph of the function $f(x)$, answer the following.



1. What is the domain of f ?

1. $[-5, 5]$

2. What is the range of f ?

2. $[-3, 5]$

3. Over what interval is f increasing?

3. $(1, 5)$

4. Over what interval is f decreasing?

4. $(-5, -2)$

5. Over what interval is f constant?

5. $(-2, 1)$

6. For what number does f have a relative maximum?

6. 5

7. What is the relative maximum?

7. 5

8. For what number does f have a relative minimum?

8. $(-2, 1)$

9. What is the relative minimum?

9. -3

10. $f(5) - f(1) = ?$ $5 - (-3) = 8$

10. 8

11. $f(0) = ?$

11. -3

12. What are the zeros of the function?

12. $x \approx 2.9, x \approx 1.5$

13. What is the value of x when $f(x) = -3$?

13. $(-2, 1)$

14. Is the function even, odd, or neither?

14. neither

15. Find the average rate of change from $x_1 = -3$ to $x_2 = 5$

15. $\frac{1}{2}$

16. Is $f^{-1}(x)$ a function?

$$\frac{5-1}{5-(-3)} = \frac{4}{8} = \frac{1}{2}$$

16. no

Let $f(x) = 3x - 9$ and $g(x) = x^2 - 7x + 12$. Find the following:

16. $f + g$

16. $x^2 - 4x + 3$

17. $f - g$

17. $-x^2 + 10x - 21$

18. fg $(3x-9)(x^2-7x+12)$
 $= 3x^3 - 21x^2 + 36x - 9x^2 + 63x - 108$

18. $3x^3 - 30x^2 + 99x - 108$

19. $\frac{g}{f}$ $\frac{(x-4)(x-3)}{3(x-3)}$

19. $\frac{x-4}{3}$

20. $f^{-1}(x)$ $x = 3y - 9$
 $3y = x + 9$
 $y = \frac{1}{3}x + 3$

20. $y = \frac{1}{3}x + 3$

21. $(f \circ g)(x)$
 $f(x^2 - 7x + 12) = 3(x^2 - 7x + 12) - 9$

21. $3x^2 - 21x + 27$

22. $(f \circ g)(-2)$ $3(-2)^2 - 21(-2) + 27$
 $12 + 42 + 27$

22. 81

23. $(g \circ f)(x)$ $g(3x-9) = (3x-9)^2 - 7(3x-9) + 12$
 $9x^2 - 54x + 81 - 21x + 63 + 12$

23. $9x^2 - 75x + 156$