

12-3 Practice Problems

For the given function, determine the domain intervals where the function is positive, and the domain intervals where the function is negative.

65. $f(x) = x^3 - 9x$

66. $f(x) = x^4 - 4x^2$

67. $f(x) = \frac{1}{4}(t^2 - 2t - 15)$

68. $f(x) = -x^2 + 10x - 16$

69. $f(x) = x^3 - 3x^2$

70. $f(x) = 1 - x^3$

71. $f(x) = 3x^3 - 15x^2 + 18x$

72. $f(x) = -4x^3 + 4x^2 + 15x$

Answer Key

$$65. \quad f(x) > 0 \rightarrow (-3, 0); (3, \infty)$$

$$f(x) < 0 \rightarrow (-\infty, -3); (0, 3)$$

$$66. \quad f(x) > 0 \rightarrow (-\infty, -2); (2, \infty)$$

$$f(x) < 0 \rightarrow (-2, 0); (0, 2)$$

$$67. \quad f(x) > 0 \rightarrow (-\infty, -5); (3, \infty)$$

$$f(x) < 0 \rightarrow (-5, 3)$$

$$68. \quad f(x) > 0 \rightarrow (2, 8)$$

$$f(x) < 0 \rightarrow (-\infty, 2); (8, \infty)$$

$$69. \quad f(x) > 0 \rightarrow (3, \infty)$$

$$f(x) < 0 \rightarrow (-\infty, 0); (0, 3)$$

$$70. \quad f(x) > 0 \rightarrow (-\infty, 1)$$

$$f(x) < 0 \rightarrow (1, \infty)$$

$$71. \quad f(x) > 0 \rightarrow (-1, 0); (6, \infty)$$

$$f(x) < 0 \rightarrow (-\infty, -1); (0, 6)$$

$$72. \quad f(x) > 0 \rightarrow \left(-\frac{3}{2}, \frac{5}{2}\right)$$

$$f(x) < 0 \rightarrow \left(-\infty, -\frac{3}{2}\right); \left(\frac{5}{2}, \infty\right)$$