

**Even and Odd Functions**

| <b>Terminology</b>             | <b>Definition</b>                           | <b>Illustration</b> | <b>Type of symmetry of graph</b> |
|--------------------------------|---|---------------------|----------------------------------|
| $f$ is an <b>even</b> function | $f(x) = f(-x)$ for every $x$ in the domain  | $y = f(x) = x^2$    | With respect to the y-axis       |
| $f$ is an <b>odd</b> function  | $-f(x) = f(-x)$ for every $x$ in the domain | $y = f(x) = x^3$    | With respect to the origin       |

Determine whether  $f$  is even, odd or neither even nor odd.

1.  $f(x) = 5x^3 + 2x$

2.  $f(x) = |x| - 3$

3.  $f(x) = 3x^4 + 2x^2 - 5$

4.  $f(x) = 7x^5 - 4x^3$

5.  $f(x) = 8x^3 - 3x^2$

6.  $f(x) = 12$

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

8.  $f(x) = 3x^2 - 5x + 1$

9.  $f(x) = \sqrt{x^2 + 4}$

10.  $f(x) = \sqrt[3]{x^3 - x}$