

Classify the polynomial as constant, linear, quadratic, cubic, or quartic, and determine the leading term and the degree of the polynomial.

1) $g(x) = \frac{1}{4}x^3 - 8x + 7$

2) $f(x) = 15x^4 - 11 + 0.14x^2 - 8x$

3) $f(x) = 5x^2 - 9 + 0.11x - 9x^3$

4) $f(x) = 7$

Use the intermediate value theorem, if possible, to determine whether the function f has a real zero between a and b .

5) $f(x) = x^4 - 9x^3 + 19x^2 + 18x + 28$; $a = -1$, $b = 2$

6) $f(x) = x^3 + 4x^2 + 9x + 6$; $a = 2$, $b = 5$

Solve the problem.

7) A formula relating an athlete's vertical leap V , in inches, to hang time T , in seconds, is

$$V = 48T^2.$$

A professional basketball player has a vertical leap of 37 inches. What is his hang time?

8) A stone thrown downward with an initial velocity of 19.6 m/sec will travel a distance of s meters, where

$$s(t) = 4.9t^2 + 19.6t$$

and t is in seconds. If a stone is thrown downward at 19.6 m/sec from a height of 377.3 m, how long will it take the stone to hit the ground?

Using a graphing calculator, estimate the relative maxima and minima of the polynomial function.

9) $f(x) = x^2 - 3x - 18$

(Round approximations to one decimal place.)

10) $f(x) = 2 + 8x - x^2$

$$11) f(x) = x^3 - 3x^2 + 1$$

$$12) f(x) = 15 - 3.39x$$

Using a graphing calculator, estimate the range of the polynomial function.

$$13) f(x) = x^3 - 3x + 5$$

$$14) f(x) = 2x^4 - x^3 - 5x^2 + 5x - 2$$

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

Answer Key

Testname: 3.2PRAC

- 1) Cubic; $\frac{1}{4}x^3$; 3
- 2) Quartic; $15x^4$; 4
- 3) Cubic; $-9x^3$; 3
- 4) Constant; 7; 0
- 5) Yes
- 6) Cannot use the intermediate value theorem
- 7) 0.9 sec
- 8) 7 sec
- 9) Relative minimum: -20.2 at $x = 1.5$
- 10) Relative maximum: 18 at $x = 4$
- 11) Relative maximum: 1 at $x = 0$, Relative minimum: -3
at $x = 2$
- 12) None
- 13) $(-\infty, \infty)$
- 14) $[-9.34, \infty)$
- 15) $(-\infty, 0.25]$