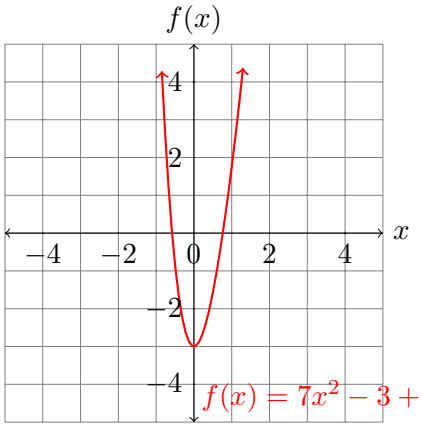
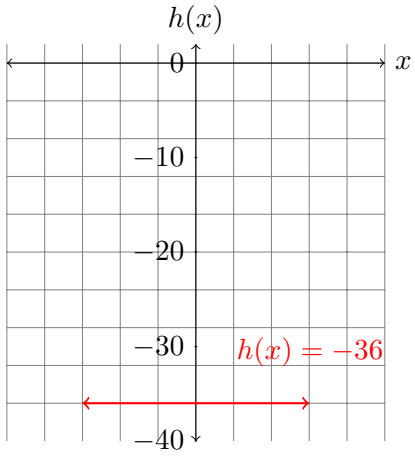
# COLLEGE ALGEBRA QUIZ

(1) Given $f(x) = 7x^2 - 3 + 0.75x^4 - 3x^3$,
   (a) Determine the leading term,
   (b) Determine the leading coefficient,
   (c) Determine the degree of the polynomial.
   (d) Determine if it is constant, linear, quadratic, cubic or quartic.

Solution:
(a) $0.75x^4$, (b) 0.75, (c) 4, (d) quartic

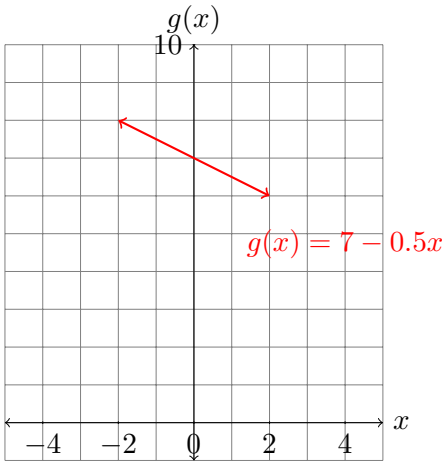


(2) Given $h(x) = -36$,
   (a) Determine the leading term,
   (b) Determine the leading coefficient,
   (c) Determine the degree of the polynomial.
   (d) Determine if it is constant, linear, quadratic, cubic or quartic.
   Solution:
   (a) $-36$, (b) -36, (c) 0, (d) constant



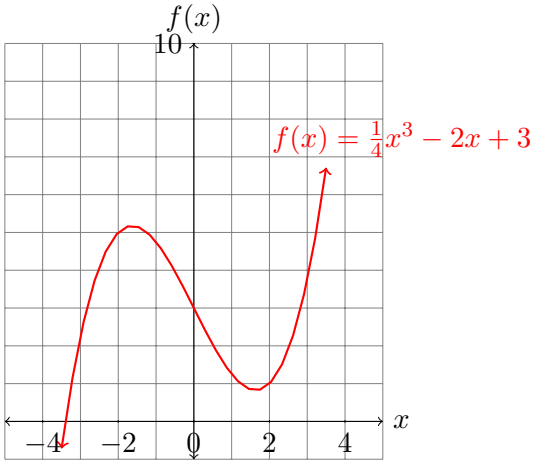
(3) Given $g(x) = 7 - 0.5x$,
   (a) Determine the leading term,
   (b) Determine the leading coefficient,
   (c) Determine the degree of the polynomial.
   (d) Determine if it is constant, linear, quadratic, cubic or quartic.

Solution:
(a) $-0.5x$, (b) -0.5, (c) 1, (d) linear

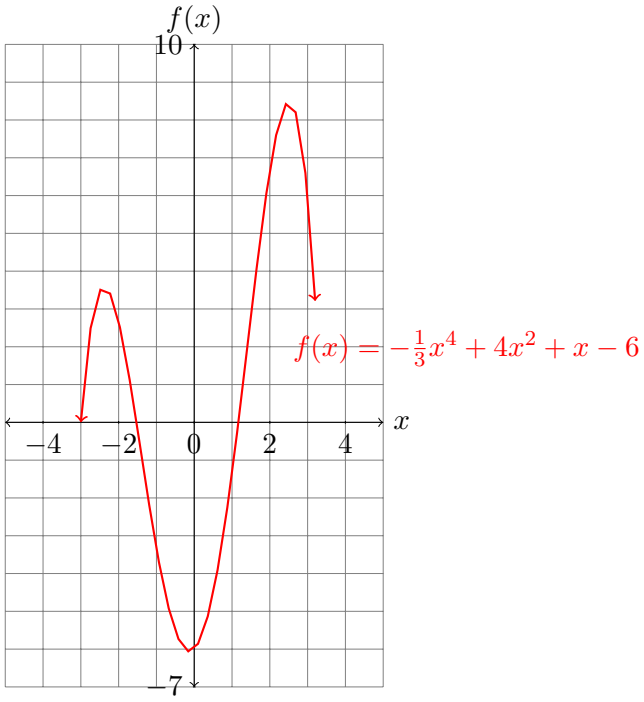


(4) Given $f(x) = \frac{1}{4}x^3 - 2x + 3$,
   (a) Determine the leading term,
   (b) Determine the leading coefficient,
   (c) Determine the degree of the polynomial.
   (d) Determine if it is constant, linear, quadratic, cubic or quartic.

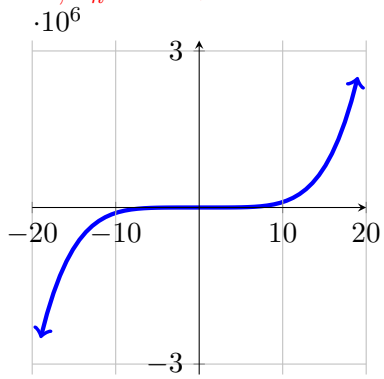
Solution:
(a) $\frac{1}{4}x^3$, (b) $\frac{1}{4}$, (c) 3, (d) cubic



(5) Using the leading term test, and $f(x) = -\frac{1}{3}x^4 + 4x^2 + x - 6$, determine the end behavior of the graph of $f(x)$.
Solution: Both ends point down,
or as $x \to \infty, f(x) \to -\infty$, and as $x \to -\infty, f(x) \to -\infty$
This is because the degree of the polynomial, n = 4, is even and the leading coefficient, $a_n = -\frac{1}{3}$ is $< 0$



(6) Using the leading term test, and $f(x) = x^5 + 4x^3 - x^2 + 3x + 4$, determine the end behavior of the graph of $f(x)$.
Solution: Left side of graph points down and right side of graph points up, or as $x \to \infty, f(x) \to \infty$, and as $x \to -\infty, f(x) \to -\infty$
This is because the degree of the polynomial, n = 5, is odd and the leading coefficient, $a_n = 1$ is $> 0$




(7) Given, $g(x) = (x - \frac{1}{4})(x + 5)^3(x - 3)^2$, find the zeros of $g(x)$ and state the multiplicity of each.
Solution: $\frac{1}{4}$, multiplicity 1; -5, multiplicity 3; 3, multiplicity 2.

(8) Given, $f(x) = x^4 - 37x^2 + 36$, find the zeros of $f(x)$ and state the multiplicity of each.
Solution: $\pm 1$ and $\pm 6$, everything is multiplicity 1.

(9) Given, $h(x) = x^3 + 5x^2 - 9x - 45$, find the zeros of $h(x)$ and state the multiplicity of each.
Solution: $-5, \pm 3$, everything has multiplicity 1.

(10) If P dollars is invested for t years at an interest rate of $r$, compounded annually, then A dollars will be the final amount.

$$A = P(1 + r)^t$$

(a) Find the interest rate $r$ if \$2500 grows to \$2704 in 2 years.
(b) Find the interest rate $r$ if \$75,000 grows to \$100,000 in 4 years.
Solution: (a)4.0%, (b) 7.5%