25 Properties of Polynomials

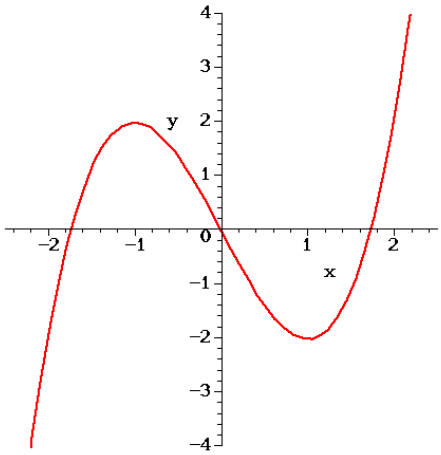
Due:
12/14/2015 at 06:00am EST.

Students will be able to:

- Describe the terms, degree, and coefficients of a polynomials
- Determine the x-intercepts and y-intercepts of a graph of polynomial
- Determine the end behavior of the graph of polynomial
- Evaluate polynomial at a point

Functions and symbols that WeBWorK understands.

Links to some useful WeBWorK pages for students



1. (1 pt)

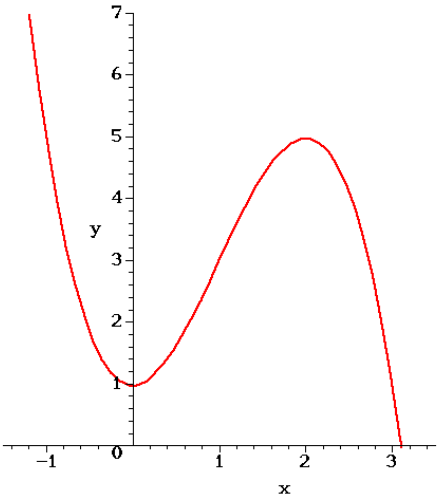
The Figure above shows the graph of

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

The answers below are all integers.

The graph f has a relative maximum at $x =$ ___ of $f(x) =$ ___.
It has a relative minimum at $x =$ ___ of $f(x) =$ ___.

The graph is decreasing in the interval [___, ___].



2. (1 pt)

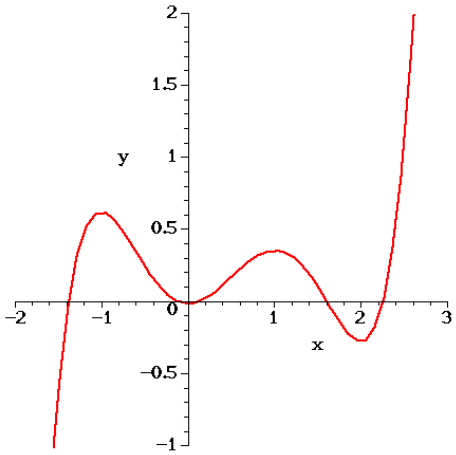
The Figure above shows the graph of

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

The answers below are all integers.

The graph f has a relative maximum at $x =$ ___ of $f(x) =$ ___.
It has a relative minimum at $x =$ ___ of $f(x) =$ ___.

The graph is increasing in the interval [___, ___].



3. (1 pt)

The Figure above shows the graph of

$$f(x) = \frac{x^5}{5} - \frac{x^4}{2} - \frac{x^3}{3} + x^2.$$

The answers below are all integers.

The graph of f shows ___ relative maxima and ___ relative minima,
for a total of ___ relative extrema.

The graph is increasing on the bounded interval [___, ___].

Note: a bounded interval is one of finite length.

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4. (1 pt) Classify the following polynomial according to its degree and number of terms:

$$f(x) = -8x$$

$f(x)$ is a ? ?.
NOTE: You have only one attempt at this problem.

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5. (1 pt) Given the function $P(x) = x^3 - 1x^2 - 30x$, find
its y-intercept is _____
its x-intercepts are x_1 =_____, x_2 =_____ and x_3 =_____ with $x_1 < x_2 < x_3$
When $x \to \infty$, $y \to$___∞ (**Input + or - for the answer**)
When $x \to -\infty$, $y \to$___∞ (**Input + or - for the answer**)

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6. (1 pt) Given the function $P(x) = (x-8)(x+4)(7x-2)$, find
its y-intercept is _____
its x-intercepts are x_1 =_____, x_2 =_____ and x_3 =_____ with $x_1 \leq x_2 \leq x_3$
When $x \to \infty$, $y \to$___∞ (**Input + or - for the answer**)
When $x \to -\infty$, $y \to$___∞ (**Input + or - for the answer**)

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7. (1 pt) Given the function $P(x) = (x-2)^2(x-7)$, find
its y-intercept is _____
its x-intercepts are x_1 =_____ and x_2 =_____ with $x_1 < x_2$
When $x \to \infty$, $y \to$___∞ (**Input + or - for the answer**)
When $x \to -\infty$, $y \to$___∞ (**Input + or - for the answer**)

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8. (1 pt) Given $P(x) = 2x^3 - 2x^2 + 4x + 8$,
$P(x) \to$ _____ if $x \to -\infty$,
$P(x) \to$ _____ if $x \to \infty$,
If your answer is $-\infty$, input -infinity; if your answer is ∞, input infinity.

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9. (1 pt) Determine the following for: $-4x^7 + (-3)x^3$
a) Determine the coefficient and the degree of each term.

Term	Coefficient	Degree
$-4x^7$	_____	_____
$-3x^3$	_____	_____

b) The degree of the polynomial is _____,
the leading term is _____,
and the leading coefficient is _____.

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10. (1 pt) Find the indicated functional values.

$$f(x) = 3x^3 + 2x^2 + 3x - 236$$

a) $f(-3)$ = _____

b) $f(0)$ = _____

c) $f(4)$ = _____