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Review

Date_____ Period____

Write a polynomial function of least degree with integral coefficients that has the given zeros.

1) $\sqrt{10},\ -\sqrt{10},\ 2\sqrt{2}$

2) $\sqrt{5},\ -\sqrt{5},\ 3+2\sqrt{2}$

Simplify each expression.

3) $(7p^4 - 7p + 4) - (8 + 4p^4 - 5p)$

4) $(4v^2 - 8 - 8v) + (2v + 1 + 4v^2)$

Factor each. One root has been given.

5) $x^4 + 10x^3 + 48x^2 + 166x + 255 = 0;\ -1 + 4i$

6) $x^4 - 4x^3 + 6x^2 - 44x + 80 = 0;\ -1 + 3i$

Divide.

7) $(x^3 - x^2 - 11x + 1) \div (x + 1)$

8) $(k^3 + 4k^2 - 23k + 72) \div (k + 8)$

Describe the end behavior of each function.

9) $f(x) = x^4 - 3x^2 - 2x$

10) $f(x) = x^3 - x^2$

State the possible rational zeros for each function. Then find all rational zeros.

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

Find all zeros. One zero has been given.

12) $f(x) = 9x^5 + 15x^4 - 48x^3 - 80x^2 + 15x + 25;\ -\frac{5}{3}$

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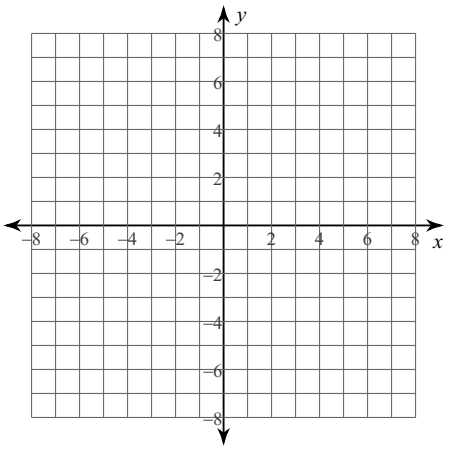
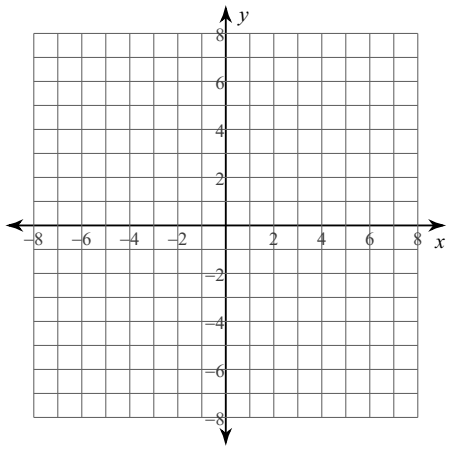
State the maximum number of turns the graph of each function could make. Then sketch the graph. State the number of real zeros. Approximate the relative minima and relative maxima to the nearest tenth.

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



14) $f(x) = x^3 - 8x^2 + 20x - 13$



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Advanced Algebra Name_____ ID: 1

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Review

Date_____ Period____

Write a polynomial function of least degree with integral coefficients that has the given zeros.

1) $\sqrt{10},\ -\sqrt{10},\ 2\sqrt{2}$

$f(x) = x^4 - 18x^2 + 80$

2) $\sqrt{5},\ -\sqrt{5},\ 3 + 2\sqrt{2}$

$f(x) = x^4 - 6x^3 - 4x^2 + 30x - 5$

Simplify each expression.

3) $(7p^4 - 7p + 4) - (8 + 4p^4 - 5p)$

$3p^4 - 2p - 4$

4) $(4v^2 - 8 - 8v) + (2v + 1 + 4v^2)$

$8v^2 - 6v - 7$

Factor each. One root has been given.

5) $x^4 + 10x^3 + 48x^2 + 166x + 255 = 0;\ -1 + 4i$

$(x + 3)(x + 5)(x^2 + 2x + 17) = 0$

6) $x^4 - 4x^3 + 6x^2 - 44x + 80 = 0;\ -1 + 3i$

$(x - 4)(x - 2)(x^2 + 2x + 10) = 0$

Divide.

7) $(x^3 - x^2 - 11x + 1) \div (x + 1)$

$x^2 - 2x - 9 + \dfrac{10}{x + 1}$

8) $(k^3 + 4k^2 - 23k + 72) \div (k + 8)$

$k^2 - 4k + 9$

Describe the end behavior of each function.

9) $f(x) = x^4 - 3x^2 - 2x$

$f(x) \to +\infty$ as $x \to -\infty$

$f(x) \to +\infty$ as $x \to +\infty$

10) $f(x) = x^3 - x^2$

$f(x) \to -\infty$ as $x \to -\infty$

$f(x) \to +\infty$ as $x \to +\infty$

State the possible rational zeros for each function. Then find all rational zeros.

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

Possible rational zeros: $\pm 1, \pm\dfrac{1}{2}$

Rational zeros: $\left\{1 \text{ mult. } 2, -\dfrac{1}{2}\right\}$

Find all zeros. One zero has been given.

12) $f(x) = 9x^5 + 15x^4 - 48x^3 - 80x^2 + 15x + 25;\ -\dfrac{5}{3}$

$\left\{\dfrac{\sqrt{3}}{3}, -\dfrac{\sqrt{3}}{3}, \sqrt{5}, -\sqrt{5}, -\dfrac{5}{3}\right\}$

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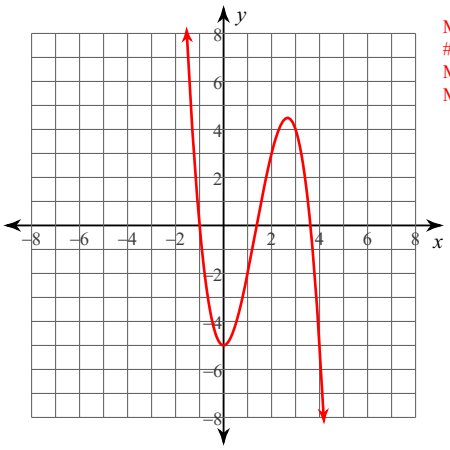
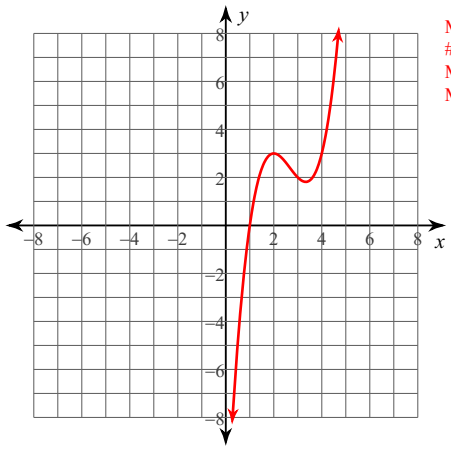
State the maximum number of turns the graph of each function could make. Then sketch the graph. State the number of real zeros. Approximate the relative minima and relative maxima to the nearest tenth.

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



Max # Turns: 2
Real Zeros: 3
Minima: $(0, -5)$
Maxima: $(2.7, 4.5)$

14) $f(x) = x^3 - 8x^2 + 20x - 13$



Max # Turns: 2
Real Zeros: 1
Minima: $(3.3, 1.8)$
Maxima: $(2, 3)$

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