

Unit 2 Assessment: Polynomials - Retake Qualifier

Name:

Factoring Quadratics when $a = 1$ Factor Completely

$x^2 + 8x + 7$	$a^2 + 4a - 12$
$b^2 - b - 54$	$k^2 - 13k + 40$

Factoring Quadratics when $a > 1$ Factor Completely

$3p^2 - 2p - 5$	$2n^2 + 3n - 9$
$3x^2 - 8x + 4$	$2m^2 + 11m + 5$

Creating polynomial functions

Create a polynomial that has the given solutions/zeros. Write it in standard form.

Solutions/zeros at: $\{-4, 3, 1\}$

Create a polynomial that has the given solutions/zeros. Write it in standard form.

Solutions/zeros at: $\{-3, 2, 3\}$

Graphing Polynomial Functions

Graph $f(x)$ in the space provided. Fill in the table with 5 coordinates. Write down the **solutions/zeros**, **maxima**, and **minima**.

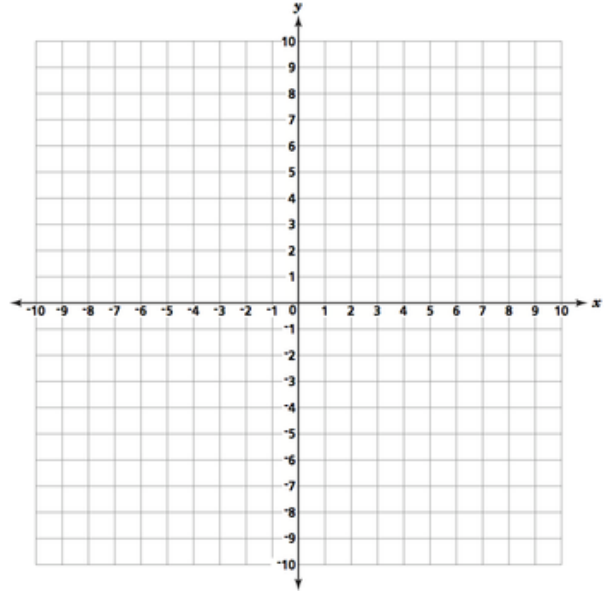
$$f(x) = x^5 - 4x^3 + 4x - 1$$

x	f(x)

Solutions/zeros:

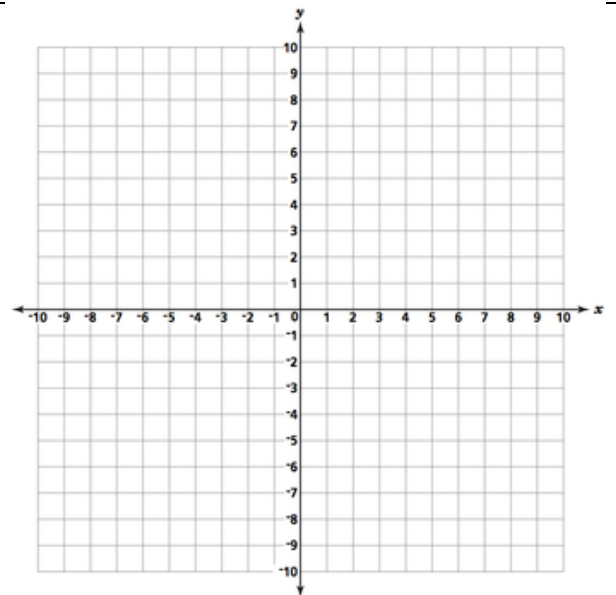
Maxima:

Minima:



Create and graph a 3rd degree polynomial $f(x)$ with a positive leading coefficient, and solutions of the function at **-2**, **1**, and **3**.

Label the **solutions**, the **maximum**, and the **minimum**.



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A rectangular prism is $(2x + 7)$ feet wide, $(5x + 2)$ feet long, and $(x - 4)$ feet high.

Hint: $Volume = length \times width \times height$

a. Write a function for the volume of the box:

b. Find Volume of the box in ft^3 when $x = 5$:

Synthetic Division and Remainder Theorem

Use synthetic division to divide.

$$(x^3 + 7x^2 + 14x + 3) \div (x + 2)$$

$$(x^3 + 5x^2 - 32 - 7) \div (x - 4)$$

Use synthetic division to divide the polynomial.

$$(x^3 + 6x^2 - 21x - 18) \div (x - 3)$$

- Is $x - 3$ a factor of $x^3 + 6x^2 - 21x - 18$? Explain your reasoning.
- Is $x + 2$ a factor of $x^3 + 6x^2 - 21x - 18$? Use synthetic division to determine your answer.
- List 2 points of $x^3 + 6x^2 - 21x - 18$ on the graph based on the Remainder Theorem.

If the polynomial $x^4 - 5x^3 + 5x^2 + kx - 6$ is exactly divisible by $x - 2$, what is the value of k ?

When $x^3 - x + 9$ is divided by the polynomial $D(x)$, the quotient is $x^2 - 2x + 3$ and the remainder is 3. Find $D(x)$.

Suppose $p(x) = x^3 - 2x^2 + 13x + k$. The remainder of the division of $p(x)$ by $(x + 1)$ is -8 . What is the remainder of the division of $p(x)$ by $(x - 1)$?

- A -8
- B 8
- C 16
- D 20

Synthetic Division and Factoring

Factor the polynomial completely. One factor has been given.

$$x^3 + x^2 - 16x - 16; x + 4$$

Factor the polynomial **completely** and find all **zeros/solutions**. One factor has been given.

$$f(x) = 3x^3 - 4x^2 - 9x + 10; x - 2$$

The volume of a rectangular prism is represented by the expression $(x^3 - 2x^2 - 20x - 24)$. If the length is $(x - 6)$ and the height and width are equal, what is the width of the prism? Express your answer as a binomial.