

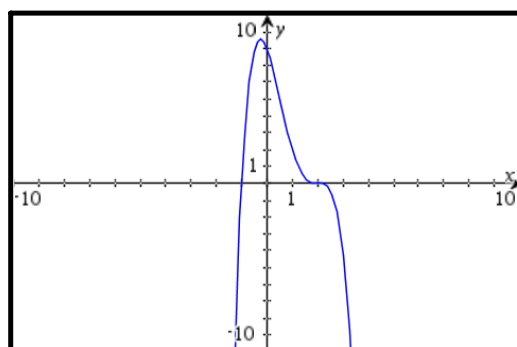
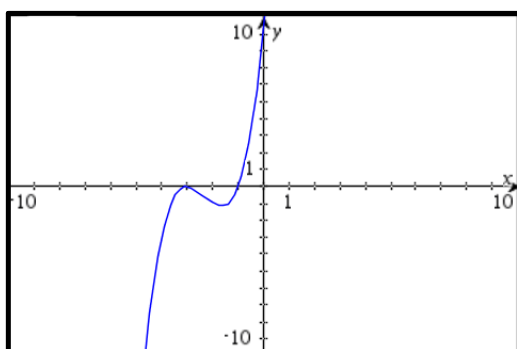
Polynomial Functions Review

Lesson 5

Section 3.1: Polynomial Function Characteristics

1. For each of the following graphs,

determine whether the graph is an even or odd degree polynomial
determine if the leading coefficient is positive or negative
state the number of x-intercepts
state the domain and range



2. The predicted population, P , of a town in t years from now can be modeled by the function $P(t) = 6t^4 - 6t^3 + 200t + 12000$. Assume this model can be used for the next 15 years.
- What are the key features of the graph of this function?
 - What is the current population of this town?
 - What will the population be 10 years from now?
 - When will the population reach approximately 175 000?

Section 3.2 The Remainder Theorem

1. Use long division to divide $5x^3 - 7x^2 - x + 6$ by $x - 1$.

Express your answer in a division statement of the form,

$$\frac{P(x)}{x - a} = Q(x) + \frac{R}{x - a} \quad \text{or} \quad P(x) = D(x) \cdot Q(x) + R$$

2. Use synthetic division to divide $x^3 + 2x^2 - 3x + 9$ by $x + 3$.

Express your answer in a division statement.

3. Use the remainder theorem to find the remainder of the following,

a. $(2x^3 + 7x^2 - x + 9) \div (x + 2)$

b. $(x^3 + 2x^2 - 3x + 5) \div (x - 3)$

c. $(2x^4 + 7x^2 - 8x + 3) \div (x - 4)$

4. Determine the value of m such that when $x^4 - mx^3 + 7x - 6$ is divided by $x - 2$, the remainder is -8 .

5. When a polynomial $P(x)$ is divided by $x - 2$, the quotient is $x^2 + 4x - 7$ and the remainder is -4 . What is the polynomial?

Section 3.3: The Factor Theorem

1. What is the corresponding binomial factor of a polynomial, $P(x)$, given the value of the zero?

a. $P(7) = 0$

b. $P(-3) = 0$

c. $P(c) = 0$

2. Factor the following fully.

a. $x^3 - 4x^2 + x + 6$

b. $3x^3 - 5x^2 - 26x - 8$

c. $5x^4 + 12x^3 - 101x^2 + 48x + 36$

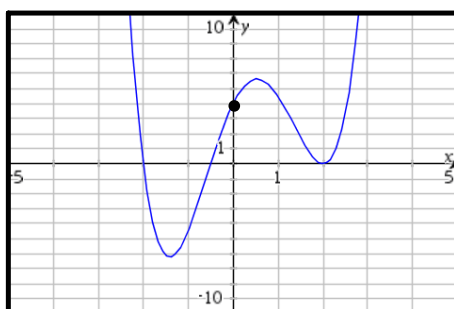
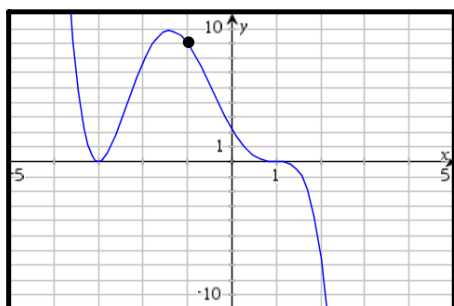
d. $2x^4 + 5x^3 - 8x^2 - 20x$

3. Rectangular blocks of ice are cut up and used to build the front entrance of an ice castle. The volume, in cubic feet, of each block is represented by $V(x) = 5x^3 + 7x^2 - 8x - 4$, where x is a positive real number. What are the factors that represent possible dimensions, in terms of x , of the blocks?

Section 3.4: Equations and Graphs of Polynomial Functions

1. For each graph of a polynomial function, determine

- the least possible degree
- the sign of the leading coefficient
- the x-intercepts and their multiplicity
- the intervals where the function is positive or negative
- the equation for the polynomial



2. Given the function $y = x^5$, list the parameters of the transformed polynomial function $y = -2\left[\frac{1}{3}(x-1)\right]^5 + 4$ and describe how each parameter transforms the graph of the function $y = x^5$.

Determine the domain and range of the transformed function.

3. Determine the equation with least degree for a cubic function with zeros - 2 (multiplicity 2), and 3 (multiplicity 1), and a y-intercept of 36.

Homework

1. Chapter 3 Review: Text Pgs. 153 - 154, #1 - 15
2. Chapter 3 Practice Test: Text Pgs. 155 - 156, #1 - 10



Attachments

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