

Pre-Calculus
Chapter 2 Review

Name: _____

Problems are a combination of free-response and multiple-choice!

I can sketch the graph polynomial functions from both factored and standard forms.

1) $y = -2x^2(x-3)(x+4)^2$

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

3) What is the end-behavior of the polynomial $f(x) = 4x^3(4-x)^2(5-5x)^3$?

a. $\downarrow\uparrow$

b. $\uparrow\downarrow$

c. $\uparrow\uparrow$

d. $\downarrow\downarrow$

4) Find all roots (with multiplicity) of the polynomial $y = 5x^3 + 6x^2 - 45x - 54$ given $(x+3)$ is a factor.

a. $y = (x+3)(x-3)(5x+6)$

b. $x = 3(\text{mult}1), -3(\text{mult}1), \frac{-6}{5}(\text{mult}1)$

c. $y = (x+3)^2(5x+6)$

d. $x = -3(\text{mult}2), \frac{-6}{5}(\text{mult}1)$

I can find and use polynomial functions to model problem situations.

5) "Box" Problem

A rectangular sheet of cardboard measures 16cm by 6cm. Equal squares are cut out of each corner and the sides are turned up to form an open rectangular box. What dimensions will give the maximum volume? What is the maximum volume of the box?

6) "Maximum Revenue" Problem

Calculators are sold to students for 20 dollars each. Three hundred students are willing to buy them at that price. For every 5 dollar increase in price, there are 30 fewer students willing to buy the calculator. What selling price will produce the maximum revenue and what will the maximum revenue be?

I can sketch the graph of rational functions.

7) Identify all holes, roots, and asymptotes, then sketch the graph of $y = \frac{2x+5}{x-1}$.

8) Identify all holes, roots, and asymptotes, then sketch the graph of $y = \frac{2x^2+5}{x^2-25}$.

9) What is the equation of the slant asymptote of $f(x) = \frac{x^3}{x^2-9}$?

a. $y = x$

b. The asymptote is horizontal, $y = 1$.

c. $y = x+9$

d. $x = 3, -3$

10) Find the domain and range of the rational function $y = \frac{-3}{x+7} + 8$.

a. D : all real numbers
 R : all real numbers

b. D : $x \neq -7$
 R : $y \neq -3$

c. D : $x \neq -7$
 R : $y \neq 8$

d. D : $x \neq 0$
 R : $y \neq 0$

I can perform operations with complex numbers.

11) $(2+4i)+6i$

12) $(-6-3i)-(5-9i)$

13) $(8-2i)(5+3i)$

14) $\frac{9+i}{7-2i}$

15) How many complex roots can a 5th degree polynomial have? Select all that are possible.

a. 5 complex, 0 real

b. 2 complex, 3 real

c. 5 real, 0 complex

d. 4 complex, 1 real

