Name: _____ Class: _____ Date: _____ ID: A

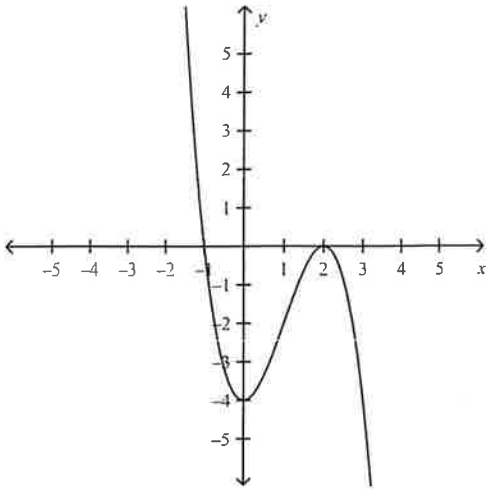
## Test Review Part I-- turn in packet at end of class

**Multiple Choice**
*Identify the choice that best completes the statement or answers the question.*

____ 1. Use synthetic substitution to evaluate the polynomial $P(x) = x^3 - 4x^2 + 4x - 5$ for $x = 4$.
a. $P(4) = -149$
b. $P(4) = 11$
c. $P(4) = -53$
d. $P(4) = 149$

____ 2. Determine whether the binomial $(x - 4)$ is a factor of the polynomial $P(x) = 5x^3 - 20x^2 - 5x + 20$.
a. Cannot determine.
b. $(x - 4)$ is a factor of the polynomial $P(x) = 5x^3 - 20x^2 - 5x + 20$.
c. $(x - 4)$ is not a factor of the polynomial $P(x) = 5x^3 - 20x^2 - 5x + 20$.

____ 3. Computer graphics programs often employ a method called *cubic splines regression* to smooth hand-drawn curves. This method involves splitting a hand-drawn curve into regions that can be modeled by cubic polynomials. A region of a hand-drawn curve is modeled by the function $f(x) = -x^3 + 3x^2 - 4$. Use the graph of $f(x) = -x^3 + 3x^2 - 4$ to identify the values of $x$ for which $f(x) = 0$ and to factor $f(x)$.




a. $x = -1; x = 2; f(x) = (x + 1)(x - 2)^2$
b. $x = 1; x = -2; f(x) = -(x - 1)^2(x + 2)$
c. $x = -1; x = 2; f(x) = -(x + 1)(x - 2)^2$
d. $x = -1; x = 2; f(x) = -(x + 1)^2(x - 2)$

____ 4. Identify the leading coefficient, degree, and end behavior of the function $P(x) = -5x^4 - 6x^2 + 6$.

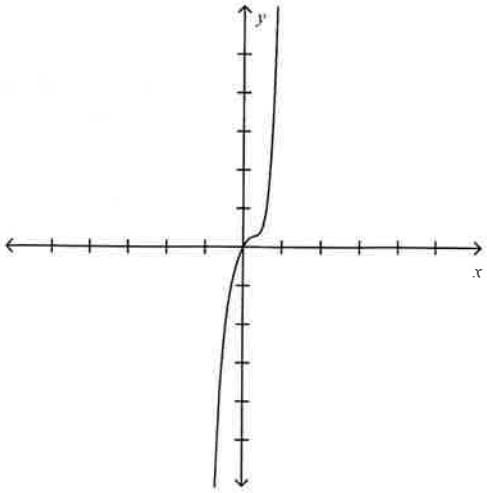
a. The leading coefficient is –5. The degree is 4.
As $x \to -\infty$, $P(x) \to +6$ and as $x \to +\infty$, $P(x) \to +6$

b. The leading coefficient is –5. The degree is 6.
As $x \to -\infty$, $P(x) \to -\infty$ and as $x \to +\infty$, $P(x) \to -\infty$

c. The leading coefficient is –5. The degree is 6.
As $x \to -\infty$, $P(x) \to +6$ and as $x \to +\infty$, $P(x) \to +6$

d. The leading coefficient is –5. The degree is 4.
As $x \to -\infty$, $P(x) \to -\infty$ and as $x \to +\infty$, $P(x) \to -\infty$

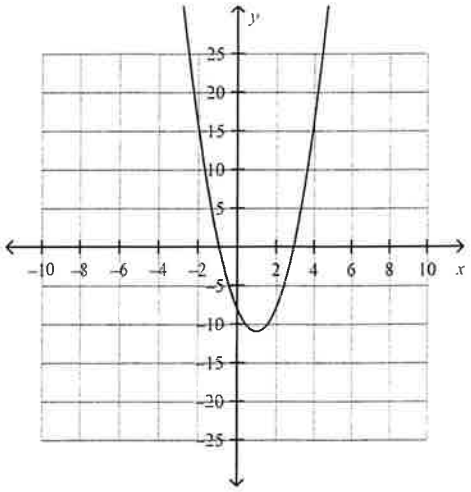
____ 5. Identify whether the function graphed has an odd or even degree and a positive or negative leading coefficient.



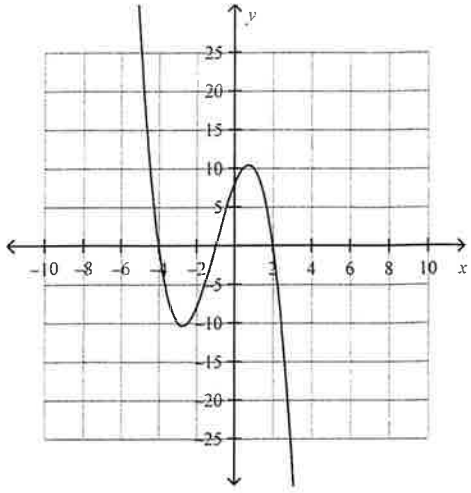

a. The degree is even, and the leading coefficient is negative.
b. The degree is odd, and the leading coefficient is negative.
c. The degree is odd, and the leading coefficient is positive.
d. The degree is even, and the leading coefficient is positive.

____ 6. Graph the function $f(x) = x^3 + 3x^2 - 6x - 8$.

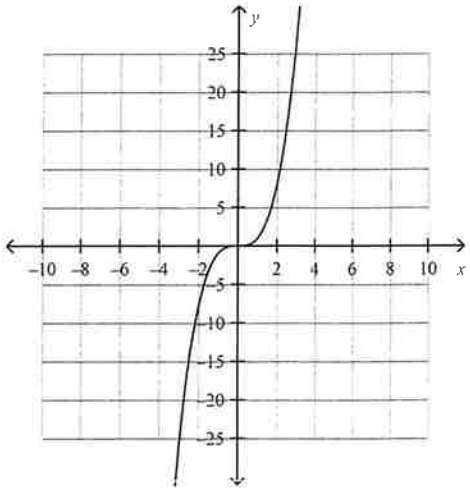
a.



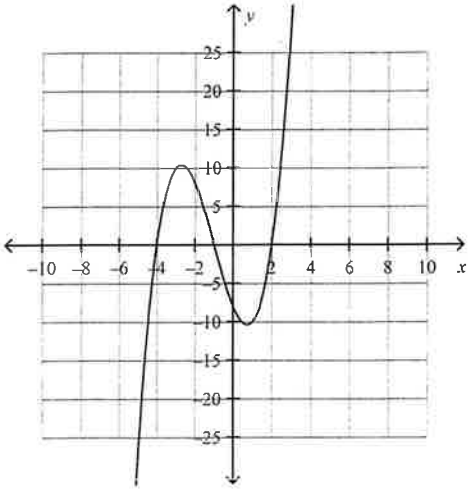
c.



b.



d.



____ 7. Simplify $\dfrac{2z^3 - 6z^2}{z^2 - 3z}$. Identify any $z$-values for which the expression is undefined.

a. $2z\left(z^2 - 3z\right)$; $z \neq 3$ or 0

b. $2z$; $z \neq 3$ or 0

c. $2z$; no excluded values

d. $2z$; $z \neq 3$

____ 8. Simplify $\dfrac{10 - x^2 - 3x}{x^2 + 2x - 8}$. Identify any $x$-values for which the expression is undefined.

a. $\dfrac{-x-5}{x+4}$; The expression is undefined at $x = -4$.

b. $\dfrac{x+5}{x+4}$; The expression is undefined at $x = -4$.

c. $\dfrac{x+5}{x+4}$; The expression is undefined at $x = 2$ and $x = -4$.

d. $\dfrac{-x-5}{x+4}$; The expression is undefined at $x = 2$ and $x = -4$.

____ 9. Multiply $\frac{8x^4y^2}{3z^3} \cdot \frac{9xy^2z^6}{4y^4}$. Assume that all expressions are defined.

a. $6x^5z^3$
b. $\frac{3}{2}x^3y^2z$
c. $6x^5y^8z^9$
d. $6x^4yz^2$

____ 10. Solve $\frac{x^2+x-30}{x-5} = 11$. Check your answer.

a. $x = -6$
b. There is no solution because the original equation is undefined at $x = 5$.
c. $x = 16$
d. $x = 5$

____ 11. Subtract $\frac{-6x^2+x-3}{x^2+9} - \frac{-2x-4}{x^2+9}$. Identify any $x$-values for which the expression is undefined.

a. $\frac{-6x^2-x-7}{x^2+9}$; The expression is undefined at $x = \pm 3$.
b. $\frac{-6x^2-x-7}{x^2+9}$; The expression is always defined.
c. $\frac{-6x^2+3x+1}{x^2+9}$; The expression is always defined.
d. $\frac{-6x^2+3x+1}{x^2+9}$; The expression is undefined at $x = \pm 3$.

____ 12. Solve the equation $x - 9 = -\frac{18}{x}$.

a. $x = 3$ or $x = 6$
b. $x = 6$
c. $x = -3$ or $x = -6$
d. $x = 3$

____ 13. Solve the equation $\frac{6x}{x-3} = \frac{4x+6}{x-3}$.

a. $x = -\frac{3}{2}$
b. $x = 3$
c. $x = -3$
d. There is no solution.

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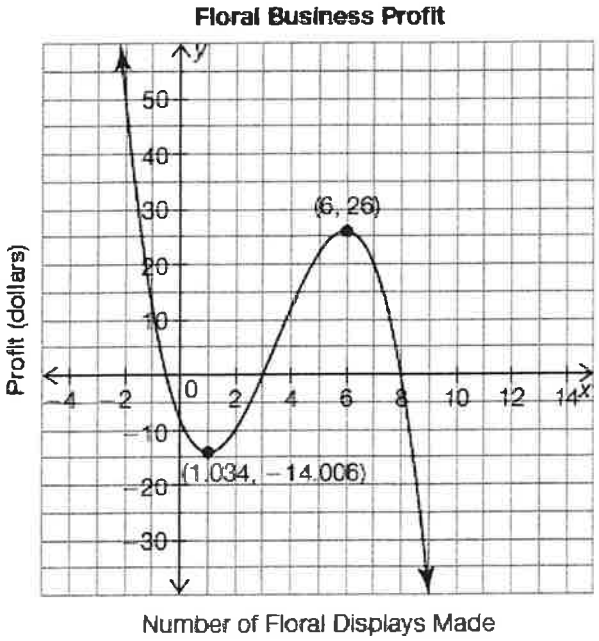
**Short Answer**

Solve each equation using the information found in the graph.

1. The graph models the amount of money a company makes producing floral displays. What is the maximum number of floral displays that the company can create and make a profit? Where is this information located on the graph?




**Problem Set**

Write the zero that corresponds to each factor.

2. $x+5$

.

3. $10x-9$

.

Write the factor that corresponds to each zero.

4. $x=\frac{2}{3}$

Determine if the given factor is a factor of each polynomial. Explain your reasoning.

5. Is $x-1$ a factor of $x^4-3x^3+6x^2-12x+8$?

**Problem Set**

Determine each function value using the Remainder Theorem. Explain your reasoning.

6. Determine $p(1)$ if $p(x) = x^4 + 3x^3 - 6x^2 - 8x$.

.

Simplify each rational expression. List any restrictions on the domain.

7. $\frac{x^2 - 1}{x - 1}$

.

8. $\frac{x^2 + x - 20}{x + 5}$

.

Calculate each sum and difference. Simplify the answer when possible.

9. $\frac{x + 2}{4} - \frac{z}{10}$

.

Multiply each expression. Describe any restriction(s) for the variables and simplify the answer when possible.

10. $\frac{1}{2x^2 + 3x - 2} \cdot \frac{x^2 - 2x - 8}{x - 4}$

.

11. $\frac{5x^2}{x + 4} \cdot \frac{3x^2 + 12x}{7x - 7} \cdot \frac{x^2 - 2x + 1}{3}$