Practice Test #3

Name Key

1. Rewrite the polynomial $6x^4 - 9x^3 - 36x^2 + 54x$ by factoring.

   a. $6x(x^2 - 6)(2x - 3)$
   b. $6x(x^2 + 6)(2x + 3)$
   c. $3x(x^2 - 6)(2x - 3)$
   d. $3x(x^2 + 6)(2x + 3)$

$3x(2x^3 - 3x^2 - 12x + 18)$ Grouping

$3x(x^2(2x-3) - 6(2x-3))$

$3x(x^2 - 6)(2x - 3)$

2. $(-5x^4y^3 + 2y^2) + (2x^3y^3 + 7x^4y^3 + 10y^2) + (-13y^2 - x^3y^3)$

   a. $-3x^4y^3 + 10x^3y^3 - y^2$
   b. $2x^4y^3 + x^3y^3 - y^2$
   c. $9x^4y^3 + 10x^3y^3 - y^2$
   d. $2x^4y^3 + 10x^3y^3 - y^2$

$2x^4y^3 - 11y^2 + x^3y^3 + 10y^2$

$2x^4y^3 - y^2 + x^3y^3$

3. Which of the following answers is a factor of the polynomial, $x^3 + 8x^2 - 3x - 90$

   a. $x + 5$
   b. $x + 2$
   c. $x - 6$
   d. $x + 10$

type in calculator

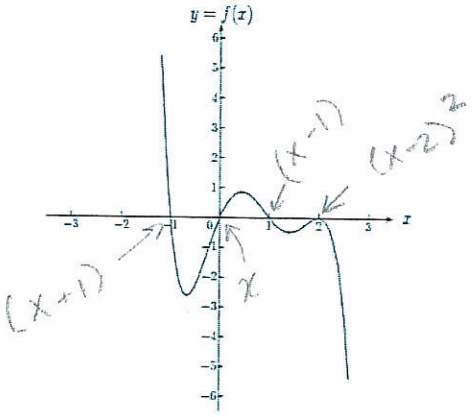
Check zeros

zeros $\Rightarrow x = -6, -5, 3$

factors $(x+6)(x+5)(x-3)$

4. Which of the following is the function graphed.

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



negative L.C.

5. Find the product of $(x - 2y)^3$

$x^3 - 6x^2y + 12xy^2 - 8y^3$

$(x-2y)(x-2y)(x-2y)$

$(x-2y)(x^2 - 2xy - 2xy + 4y^2)$

$(x-2y)(x^2 - 4xy + 4y^2)$

$x^3 - 4x^2y + 4xy^2$

6. Using polynomial identities, factor $8x^3 + y^3 - 2x^2y + 8xy^2 - 8y^3$

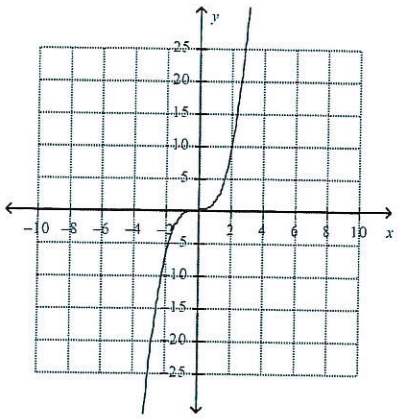
   a. $(2x + y)(x^2 - xy + y^2)$
   b. $(2x - y)(4x^2 + 2xy + y^2)$
   c. $(2x + y)(4x^2 - 2xy + y^2)$
   d. $(2x - y)(4x^2 - xy + y^2)$

$(2x+y)(4x^2 - 2xy + y^2)$

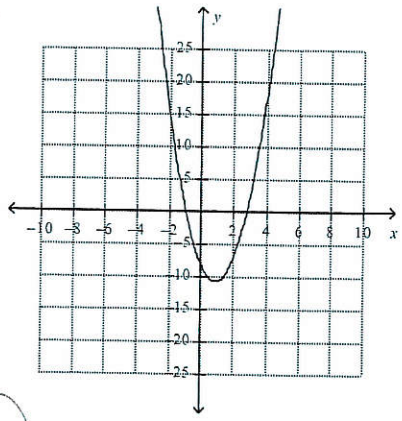
Name _____

7. Which is the graph of $g(x) = x^3 + 3x^2 - 6x - 8$

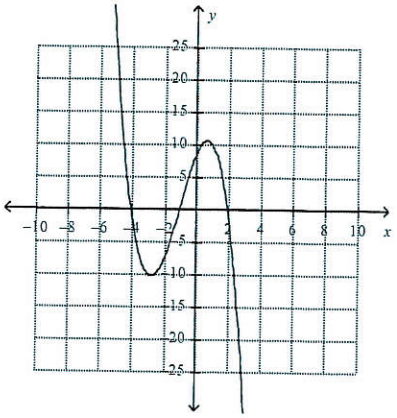
a.



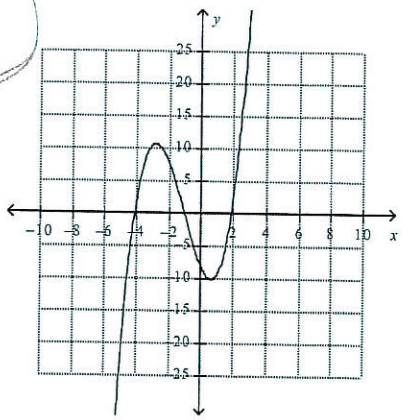
c.



b.



d.



8. Given $p(x) = x^2 + x - 6$, which of the following are true?

x^2+x-6

$(x+3)(x-2)$

I. $(x + 3)$ is a factor of $p(x)$ True

II. $x = 2$ is a root of $p(x) = 0$ True

a. Neither I or II
b. Only I is true
c. Only II is true
d. Both I and II are true

9. The polynomial $g(x) = (x + 5)^3(x - 7)^2$ is written in factored form. Fill in the chart below with respect to the zeroes of this polynomial.

What are the Zeroes	What is their Multiplicity	Touches or crosses the x-axis
$x = -5$	3	crosses
$x = 7$	2	touches

10. A third-degree polynomial has real zeroes of 5, -4 and 1. Write that polynomial as a product of linear factors (factored form) and in standard form.

$f(x) = (x-5)(x+4)(x-1)$ ← factored form

$f(x) = (x^2 - x - 20)(x-1)$

$x^3 - x^2 - 20x$

$-x^2 + x + 20$

$f(x) = x^3 - 2x^2 - 19x + 20$ ← standard form