Name: _____ Period: _____ Date: _____

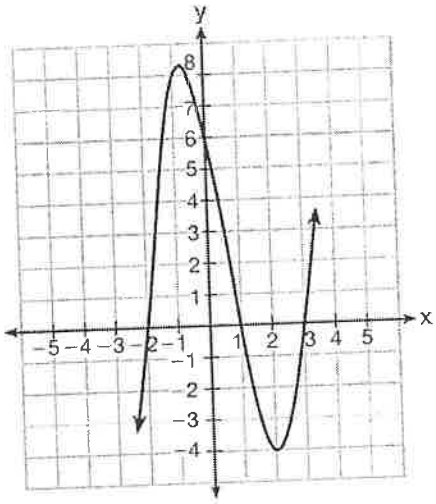
Standard **A.APR.A.2** – Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.

1.) Which equation(s) represent the graph below?

I $y = (x+2)(x^2 - 4x - 12)$

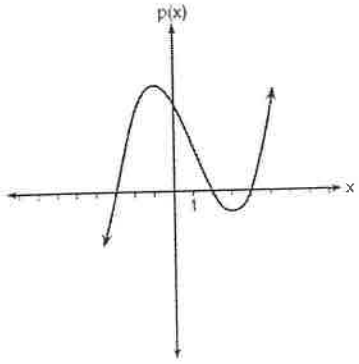
II $y = (x-3)(x^2 + x - 2)$

III $y = (x-1)(x^2 - 5x - 6)$



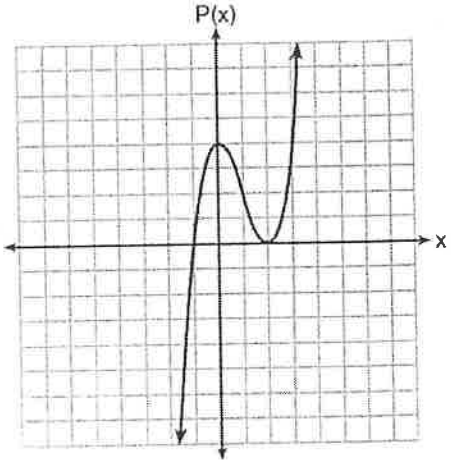
1) I, only
2) II, only
3) I and II
4) II and III

2.) Based on the graph below, which expression is a possible factorization of $p(x)$?



1) $(x+3)(x-2)(x-4)$
2) $(x-3)(x+2)(x+4)$
3) $(x+3)(x-5)(x-2)(x-4)$
4) $(x-3)(x+5)(x+2)(x+4)$

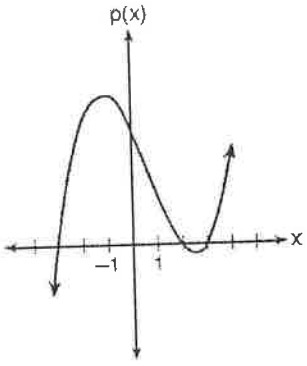
3.) Wenona sketched the polynomial $P(x)$ as shown on the axes below.



Which equation could represent $P(x)$?

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

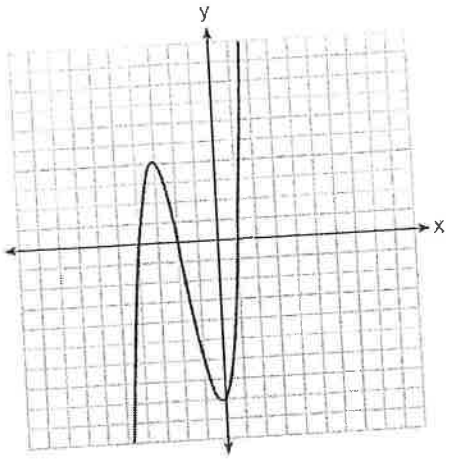
4.) The graph of the function $p(x)$ is sketched below.



Which equation could represent $p(x)$?

1) $p(x) = (x^2 - 9)(x-2)$
2) $p(x) = x^3 - 2x^2 + 9x + 18$
3) $p(x) = (x^2 + 9)(x-2)$
4) $p(x) = x^3 + 2x^2 - 9x - 18$

5.) The graph of $f(x)$ is shown below.



Which function could represent the graph of $f(x)$?

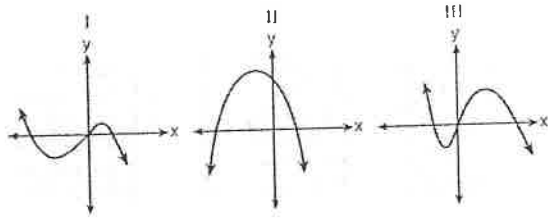
1) $f(x) = (x+2)(x^2+3x-4)$
2) $f(x) = (x-2)(x^2+3x-4)$
3) $f(x) = (x+2)(x^2+3x+4)$
4) $f(x) = (x-2)(x^2+3x+4)$

6.) When factoring to reveal the roots of the equation $x^3+2x^2-9x-18=0$, which equations can be used?

I. $x^2(x+2)-9(x+2)=0$
II. $x(x^2-9)+2(x^2-9)=0$
III. $(x-2)(x^2-9)=0$

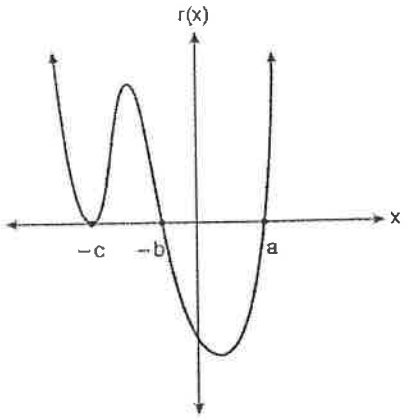
1) I and II, only
2) I and III, only
3) II and III, only
4) I, II, and III

7.) A polynomial function contains the factors x, $x-2$, and $x+5$. Which graph(s) below could represent the graph of this function?



1) I, only
2) II, only
3) I and III
4) I, II, and III

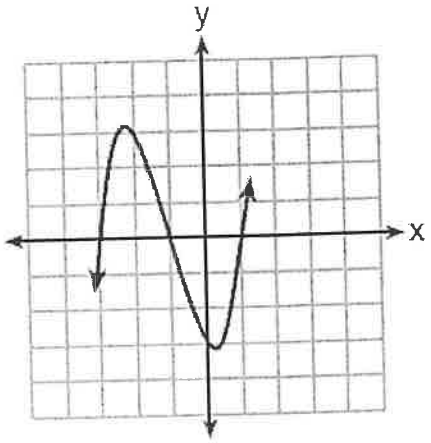
8.) A sketch of $r(x)$ is shown below.



An equation for $r(x)$ could be

1) $r(x) = (x-a)(x+b)(x+c)$
2) $r(x) = (x+a)(x-b)(x-c)^2$
3) $r(x) = (x+a)(x-b)(x-c)$
4) $r(x) = (x-a)(x+b)(x+c)^2$

9.) A cubic function is graphed on the set of axes below.



Which function could represent this graph?

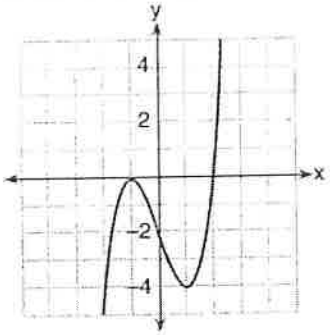
1) $f(x) = (x-3)(x-1)(x+1)$
2) $g(x) = (x+3)(x+1)(x-1)$
3) $h(x) = (x-3)(x-1)(x+3)$
4) $k(x) = (x+3)(x+1)(x-3)$

10.) Evan graphed a cubic function, $f(x) = ax^3+bx^2+cx+d$, and determined the roots of $f(x)$ to be ± 1 and 2. What is the value of b, if $a = 1$?

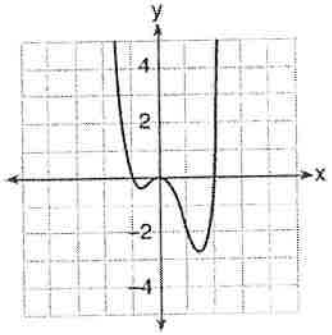
1) 1
2) 2
3) -1
4) -2

11.) Which graph represents a polynomial function that contains $x^2 + 2x + 1$ as a factor?

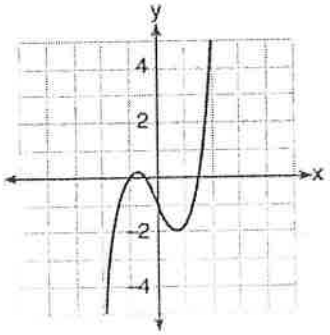
1)



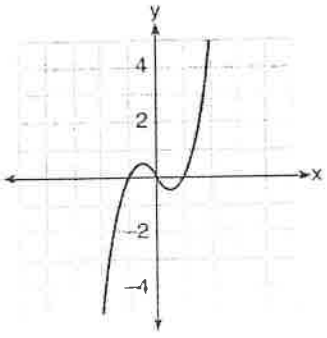
2)



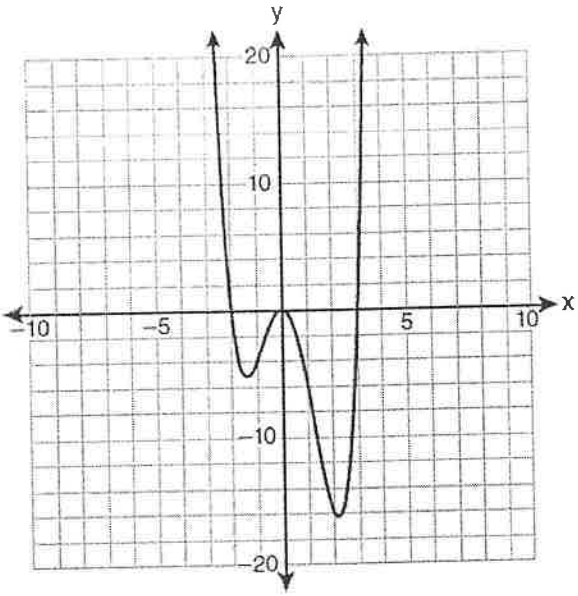
3)



4)



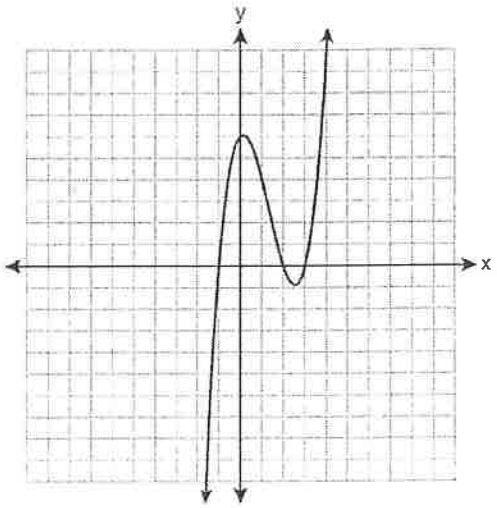
12.) The graph of $y = f(x)$ is shown below.



Which set lists all the real solutions of $f(x) = 0$?

1) $\{-3, 2\}$
2) $\{-2, 3\}$
3) $\{-3, 0, 2\}$
4) $\{-2, 0, 3\}$

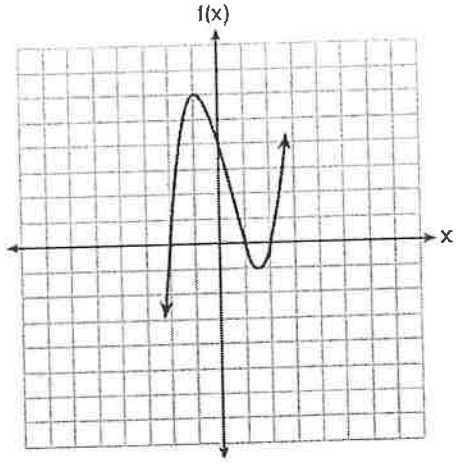
13.) The graph of $y = x^3 - 4x^2 + x + 6$ is shown below.



What is the product of the roots of the equation $x^3 - 4x^2 + x + 6 = 0$?

1) -36
2) -6
3) 6
4) 4

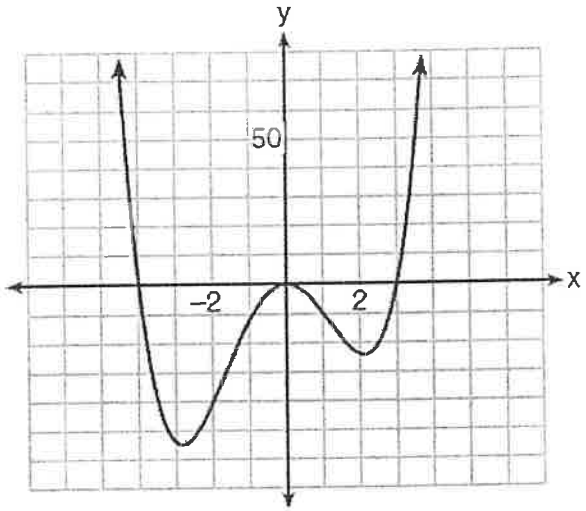
14.) A polynomial function is graphed below.



Which function could represent this graph?

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

15.) The graph of $y = f(x)$ is shown below. The function has a leading coefficient of 1.



Write an equation for $f(x)$. The function g is formed by translating function f left 2 units. Write an equation for $g(x)$.

16.) Divide $x^3+3x^2-10x-24$ by $x+4$ to find all the zeros of the polynomial.

[A] $4, -2, 3$ [B] $-4, 3, -2$ [C] $-4, 2, 3$ [D] $0, -4, -2$