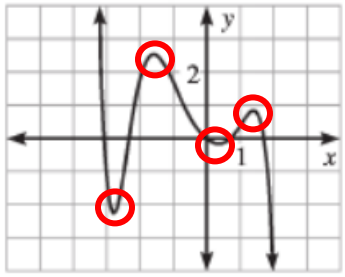
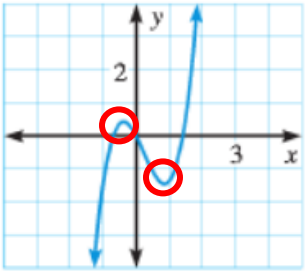
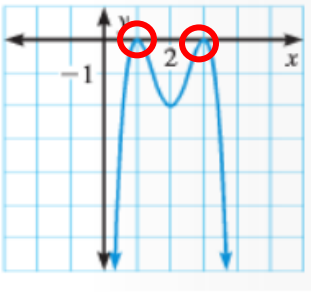
Unit 3 Test Review ANSWER KEY

1. Look at the graphs below and answer the following:







a) 5 — 3 — 4
b) Five zeros — Three zeros — Four zeros
c) $(\infty, -\infty)$ — $(-\infty, \infty)$ — $(-\infty, -\infty)$
d) (-2.5, -1.5) and (0.5, 1.5) — $(-\infty, -0.5)$ and $(0.75, \infty)$ — $(-\infty, 1)$ and (2, 3)

2. Which polynomial function has zeros at 5, –4, and –3 ?

a. $f(x) = x^3 - 60x^2 + 2x - 23$

b. $f(x) = x^3 + 2x^2 - 23x + 7$

c. $f(x) = x^3 - 17x^2 - 420x + 7$

d. $f(x) = x^3 + 2x^2 - 23x - 60$

3. Find the zeros of $f(x) = (x + 2)^6(x + 3)^4$ and state the multiplicity.

a. –2, multiplicity 6; 4, multiplicity –3

b. –2, multiplicity 6; –3, multiplicity 4

c. 6, multiplicity –2; –3, multiplicity 4

d. 6, multiplicity –2; 4, multiplicity –3

4. Divide $-x^3 + 4x^2 - x - 3$ by $x + 2$.

a. $-x^2 + 6x - 13$

b. $-x^2 + 2x + 11$, R –29

c. $-x^2 + 2x + 11$

d. $-x^2 + 6x - 13$, R 23

5. Divide $(x^4 + 12x^3 - 91x^2 + 26x + 20) \div (x - 5)$

a. $x^3 + 17x^2 - 6x - 4$

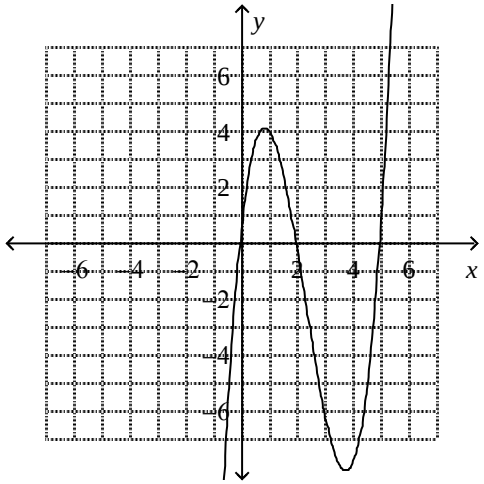
b. $x^3 - 22x^2 - 79x + 34$

c. $x^3 + 12x^2 - 22x + 34$

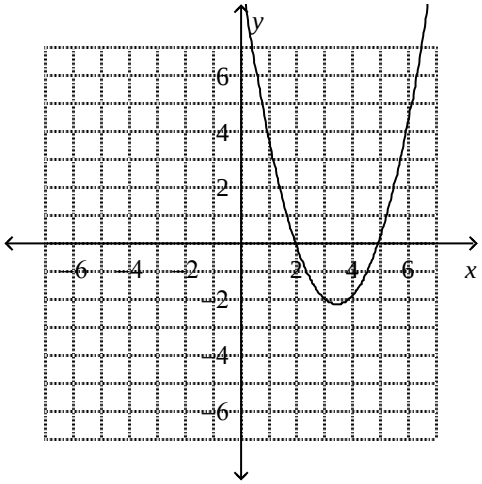
d. $x^3 - 6x^2 - 4x + 17$

6. Find the zeros of $y = x(x - 5)(x - 2)$. Then graph the equation.

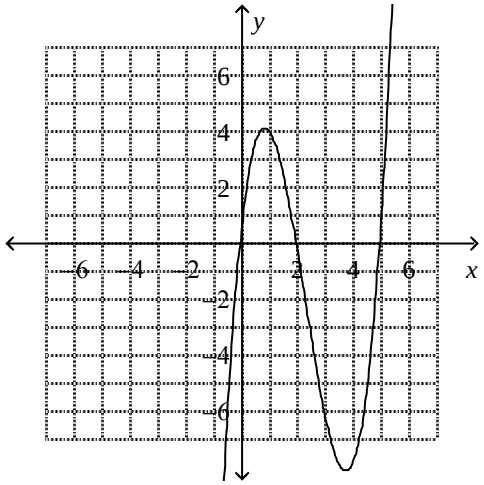
a. 5, 2, –5



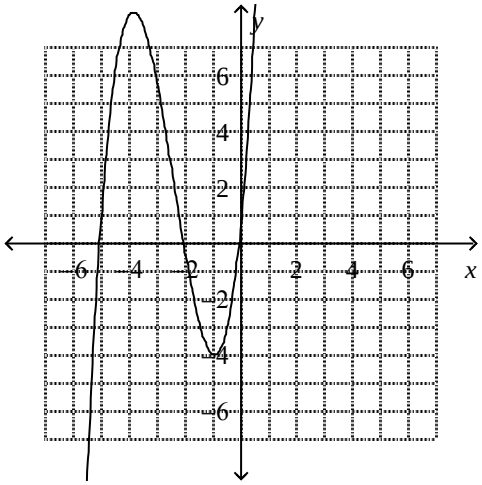
c. 5, 2



b. 0, 5, 2



d. 0, –5, –2



7. Determine which binomial is a factor of $-2x^3 + 14x^2 - 24x + 20$.

a. $x + 5$ b. $x + 20$ c. $x - 24$ d. $x - 5$

Find the roots of the polynomial equation

8. $x^3 - 2x^2 - x + 2$

a. -1, 1, 2

b. -2, 1 (mult. 2)

c. 2, -1 (mult. 2)

d. 2, -2, 1

9. $x^3 - 2x^2 - 4x + 8$

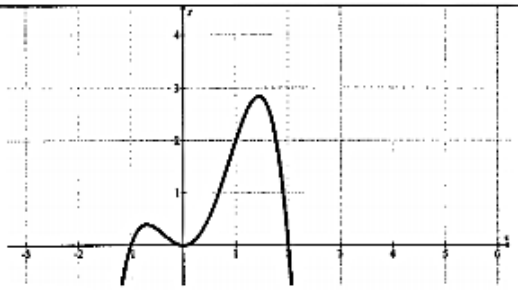
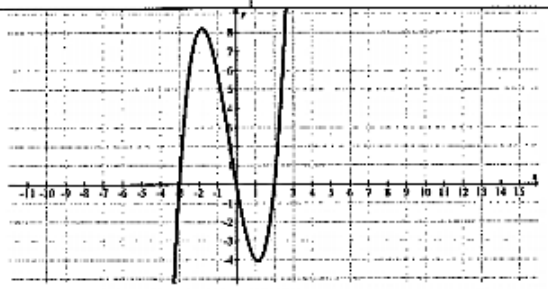
a. -2, 2, 0

b. 0, 1, 2

c. 2, -2 (mult. 2)

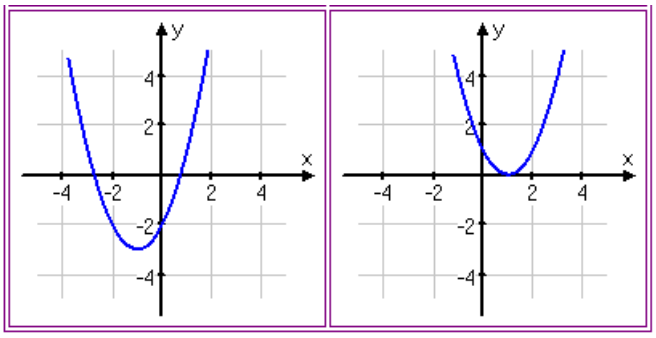
d. -2, 2 (mult. 2)

10. Complete the following table

Convert factors to roots	(x + 5) -5 is the root	(x – 3) 3 is the root	(2x + 8) -4 is the root
Convert the roots to factors	X = 7 (x – 7) is the factor	X = -9 (x + 9) is the factor	X = 1/3 (3x – 1) is the factor
Identify the FACTORS of the roots shown in the graph	 Factors: $x^2(x+1)(x-2)$	 Factors: $x(x+3)(x-2)$	
Multiplicity of the functions graphed above	Root x = 0, multiplicity = Twice Root x = -1, multiplicity = once Root x = 2, multiplicity = once		Root x = -3, multiplicity = once Root x = -1, multiplicity = once Root x = 2, multiplicity = once
Multiplicity of the each root in the function	$(x-3)^2(x+1)(x-2)^3$ Root: x = 3, multiplicity = Twice X = -1, multiplicity = once X = 2, multiplicity = three times		$(x-4)(x)(x+3)^5$ Root: x = 4, multiplicity = once X = 0, multiplicity = once X = -3, multiplicity = five times

11. Write an equation for the transformation of x^3 three units left, two units up and reflected across the x-axis. $-(x+3)^3+2$

12. Write an equation for each graph below as a transformation from $y = x^2$



$(x+1)^2-3$ $(x-1)^2$

13. A rectangular swimming pool is twice as long as it is wide. A small concrete walkway surrounds the pool. The walkway is a constant 2 feet wide and has an area of 196 square feet. Find the dimensions of the pool.

$(2x+4)(x+4)-2x^2=196$ $x=15$ the pool is 15 feet by 30 feet

14. The total number of video cassettes sold from 1995 to 2005 at Bob's store can be modeled by the function $F(x) = 4x^3+14x^2+200x+1560$ and the number of kinds of video cassettes in Bob's store from 1995 to 2005 can be modeled by $G(x) = 2x + 12$, where x is the number of years since 1995. Using division, find the average number of each kind of video cassettes that Bob sold.