

# Polynomial Functions

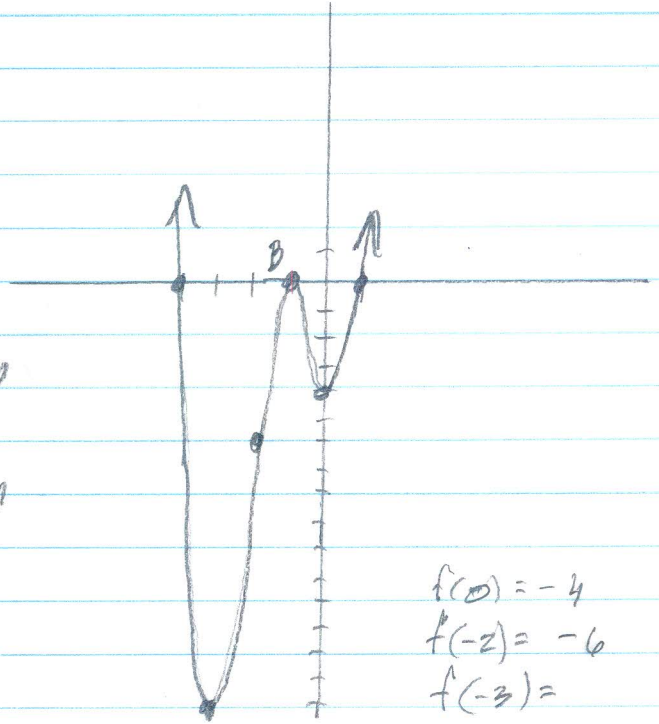
## Flashcard Questions

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

a) degree: 4  
 # t.p.: 3  
 lead: +

b) as  $x \rightarrow \pm \infty, f(x) \rightarrow \infty$

zeros	multiplicity
-1	2
-4	1
1	1



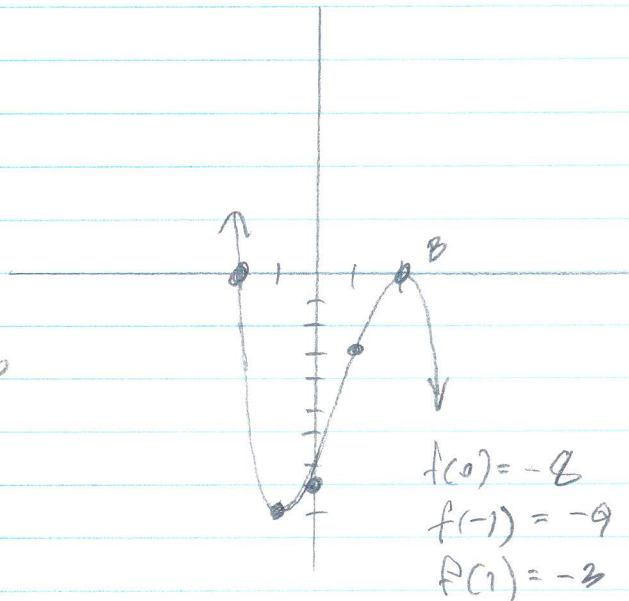
$f(0) = -4$   
 $f(-2) = -6$   
 $f(-3) =$

2)  $f(x) = -(x-2)^2(x+2)$

a) degree: 3  
 # t.p.: 2  
 lead: -

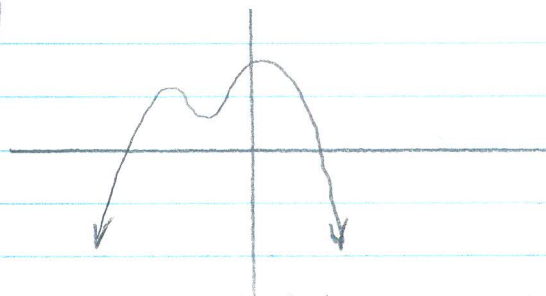
b) as  $x \rightarrow -\infty, f(x) \rightarrow \infty$   
 as  $x \rightarrow \infty, f(x) \rightarrow -\infty$

zeros	multiplicity
2	2
-2	1



$f(0) = -8$   
 $f(-1) = -9$   
 $f(1) = -3$

3) (answers may vary)



$$4) \begin{array}{r|rrrrr} -1 & 2 & 9 & 10 & 3 & \\ & -2 & -7 & -3 & & \\ \hline & 2 & 7 & 3 & 0 & \end{array}$$

$$2x^2 + 7x + 3 = (2x+1)(x+3)(x+1)$$

$$5) \begin{array}{r|rrrrrr} -2 & 2 & -1 & -28 & 9 & 90 & \\ & -4 & 10 & 36 & -90 & & \\ \hline 5/2 & 2 & -5 & -18 & 45 & 0 & \\ & & 5 & 0 & -45 & & \\ \hline & 2 & 0 & -18 & 0 & & \end{array}$$

$$2x^2 - 18 = 0$$

$$2x^2 = 18$$

$$x^2 = 9$$

$$x = \pm 3, -2, 5/2$$

$$6) \begin{array}{r|rrrr} -6 & 1 & 9 & 21 & 18 \\ & -6 & -18 & -18 & \\ \hline & 1 & 3 & 3 & 0 \end{array}$$

$$x^2 + 3x + 3 = 0$$

$$x = \frac{-3 \pm i\sqrt{3}}{2}, -6$$

$$7) \begin{array}{r|rrrrr} 4 & 1 & -8 & 9 & 56 & -112 \\ & & 4 & -16 & -28 & 112 \\ \hline & 1 & -4 & -7 & 28 & 0 \\ & & & & & x^3 - 4x^2 - 7x + 28 = 0 \end{array}$$

$$x^2(x-4) - 7(x-4)$$

$$(x-4)(x^2-7)$$

$$x = 4, \pm\sqrt{7}$$

$$8) \begin{array}{r|rrrr} 1/2 & 2 & -1 & 2 & -1 \\ & & 1 & 0 & 1 \\ \hline & 2 & 0 & 2 & 0 \end{array}$$

$$2x^2 + 2 = 0$$

$$x^2 = -1$$

$$x = \pm i, 1/2$$

9) a) (0, -36)    b) (x-1)(x-3)(x+2)    c) 1, 3, -2    d) (-1, -32)

10)  $f(x) = (x+1)(x-\sqrt{2})(x+\sqrt{2})$