

Key

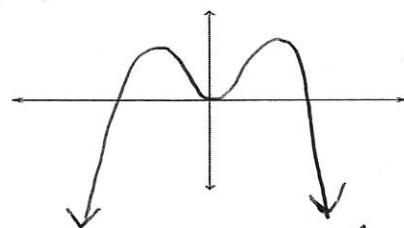
NOTES:

1) Determine the end behavior for each polynomial function below.

a.  $f(x) = -x^3 + 6x^2 - 7x + 4$  \_\_\_\_\_  
 degree 3  $\rightarrow$  J.T  
 neg  $\rightarrow$   $\uparrow$   $\downarrow$

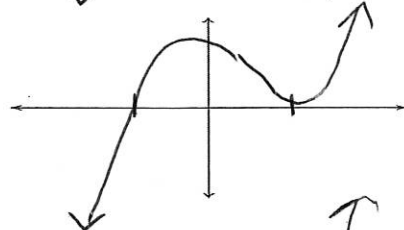
b.  $g(x) = 7 - x + 6x^2 + 8x^3 + 9x^4$  \_\_\_\_\_  
 Degree 4  
 pos  $\rightarrow$   $\uparrow$   $\uparrow$

2) a. Sketch a quartic polynomial with a negative leading coefficient.



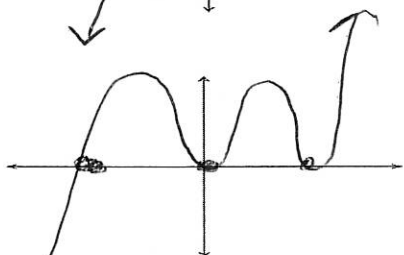
b. Sketch a cubic polynomial with one double root.

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



c. Sketch a quintic polynomial with 3 real roots.

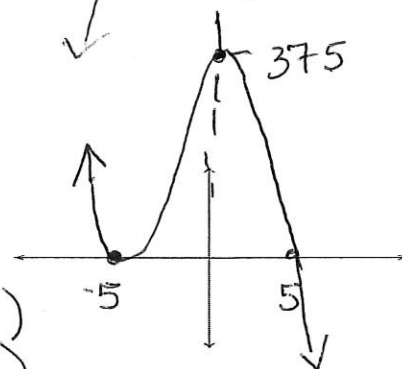
$y = x^2(x-2)^2(x+3)$   
 $0^{m^2}, 2 m^2, -3$



2) Provide a sketch of each polynomial function

a.  $g(x) = -3x^3 - 15x^2 + 75x + 375$  factor  
 $-3x^2(x+5) + 75(x+5)$

$= (x+5)(-3x^2 + 75) = (x+5)(-3)(x^2 - 25)$   
 $= -3(x+5)^2(x-5)$



zero(s) -5 m<sup>2</sup>, 5

y-intercept (0, 375)

degree 3

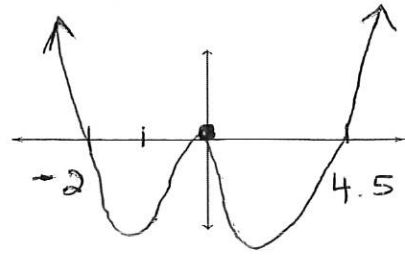
end behavior  $\uparrow$   $\downarrow$

# u-turns \_\_\_\_\_

c.  $y = 2x^4 - 7x^3 - 9x^2$

$$y = x^2 (2x^2 - 7x - 9)$$

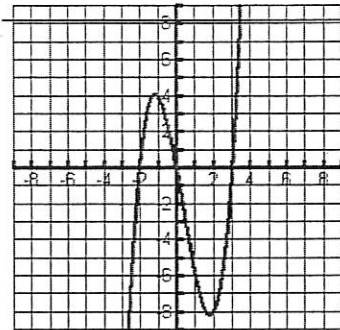
$$y = x^2 (2x - 9)(x + 2)$$



zero(s) 0, 2, 4.5, -2  
 degree 4  
 # u-turns \_\_\_\_\_

y-intercept 0, 0  
 end behavior ↑ ↑

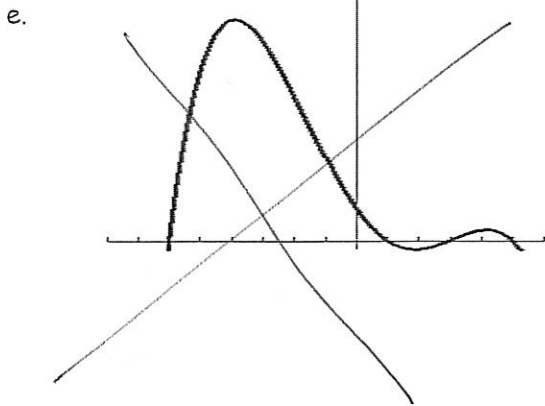
3) Write a possible equation for the following graph:



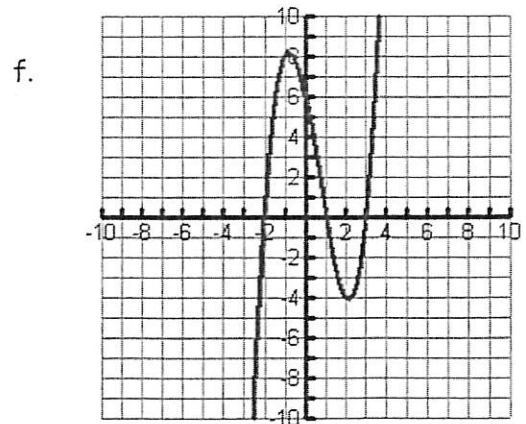
y int = 0  
 roots  
 -2 } ST  
 0 }  
 3 }

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

↓ ↑ ⇒ POS 4 degree 3



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y int = 6  
 roots -2, 1, 3 no bounces, pos

$$y = a(x+2)(x-1)(x-3)$$

$$6 = a(2)(-1)(-3)$$

$$6 = 6a$$

$$1 = a$$

$$y = (x+2)(x-1)(x-3)$$