

pg 134 #1-8

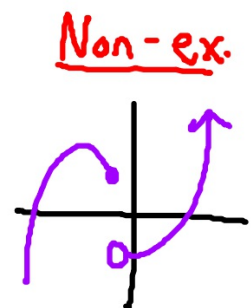
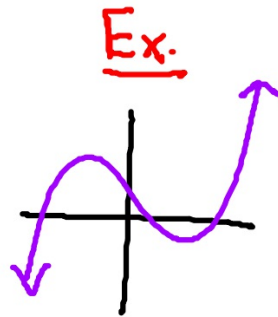
$$(77) \quad x = \frac{-b}{2a} = \frac{\frac{-24}{9}}{-\frac{8}{9}} = \frac{\cancel{-24}}{9} \cdot \frac{9}{\cancel{8}} = 3$$

$$y = \cancel{-\frac{4}{9}(9)} + \frac{24}{3 \cancel{9}}(\cancel{9}) + 12$$
$$= -4 + 8 + 12 = 16$$

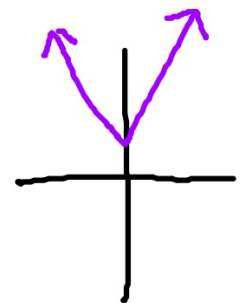
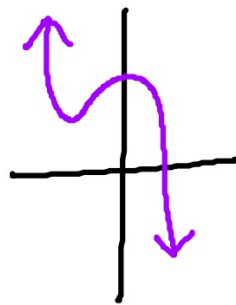
2.2) Polynomial Functions of Higher Degree

A.) Graphs:

- continuous



- smooth curves



B) End Behavior

- pg 140 - top / pg 141 - middle

- If odd degree : Pos. leading coef. 
: Neg. leading coef. 

- If even degree : Pos. leading coef. 
: Neg. leading coef. 

C) Repeated Zeros/Roots

- even # $\rightarrow$ bounces (touches x-axis)
- odd # $\rightarrow$ passes (goes thru x-axis)

Examples

① $y = -x^3 + 4x$

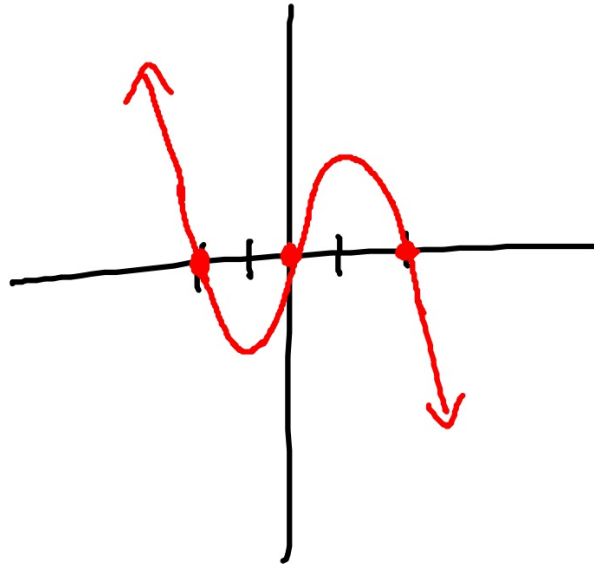
y-int: (0,0)

$$-x^3 + 4x = 0$$

$$-x(x^2 - 4) = 0$$

$$-x(x-2)(x+2) = 0$$

$$x = 0, 2, -2$$



② $y = x^4 - 5x^2 + 4$ 

y -int: $(0, 4)$

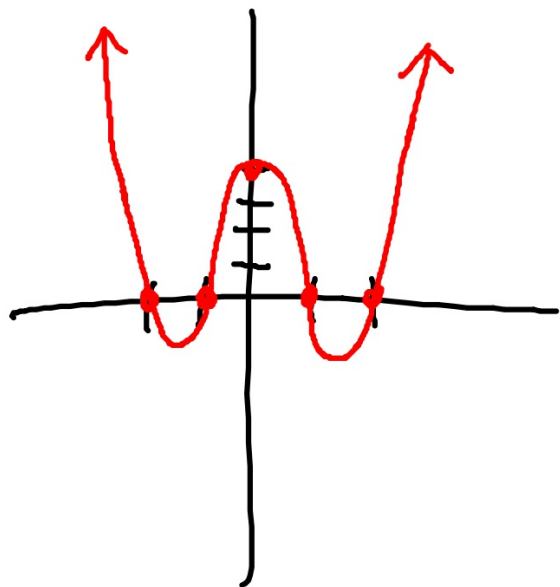
x -int: $\pm 1, \pm 2$

$$x^4 - 5x^2 + 4 = 0$$

$$(x^2 - 1)(x^2 - 4) = 0$$

$$x^2 = 1 \mid x^2 = 4$$

$x = \pm 1, \pm 2$



③ $y = x^5 - x$

y-int: $(0, 0)$

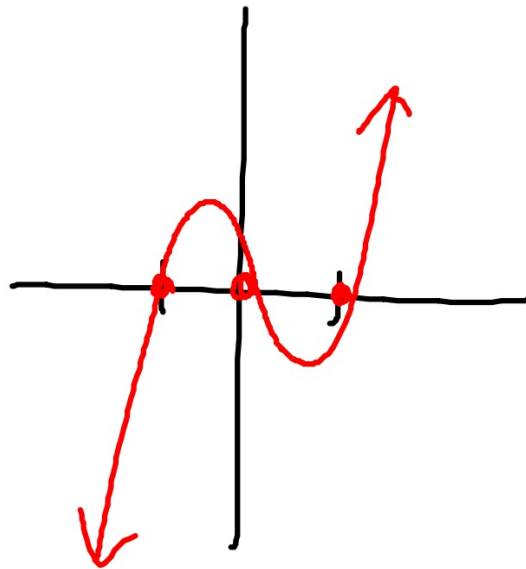
roots: $0, \pm 1, \pm i$

$$x^5 - x = 0$$

$$x(x^4 - 1) = 0$$

$$x(x^2 - 1)(x^2 + 1) = 0$$

$$x = 0, \pm 1, \pm i$$



Pg 149 # 33-41 odd

y-int (0,0)

$$(33) \quad 3x^3 - 12x^2 + 3x = 0$$

$$3x(x^2 - 4x + 1) = 0$$

$$3x = 0$$

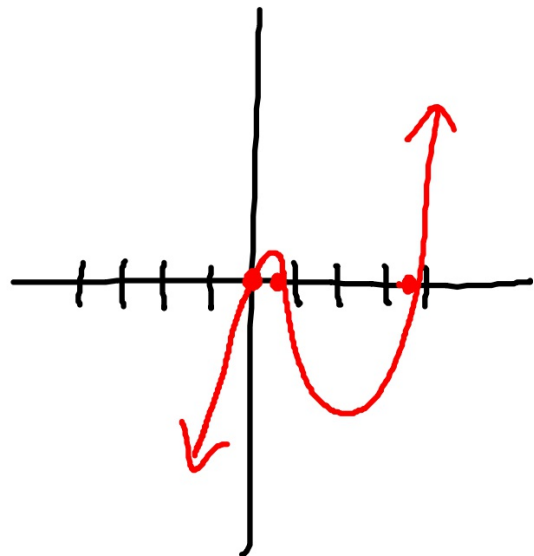
$$x = 0$$

$$x = \frac{4 \pm \sqrt{16 - 4 \cdot 1 \cdot 1}}{2}$$

$$x = \frac{4 \pm \sqrt{12}}{2}$$

$$x = \frac{4 \pm 2\sqrt{3}}{2}$$

$$x = 2 \pm \sqrt{3}$$



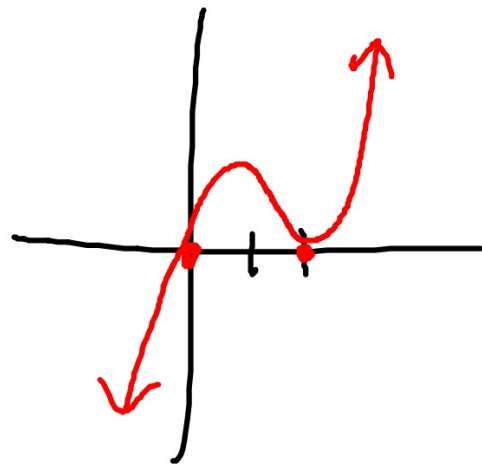
$$\textcircled{35} \quad y = x^3 - 4x^2 + 4x = 0$$

$$y\text{-int: } (0,0)$$

$$x(x^2 - 4x + 4) = 0$$

$$x(x-2)(x-2) = 0$$

$$x = 0, 2 \text{ (DR)}$$



(37) $y = x^5 - 6x^3 + 9x = 0$

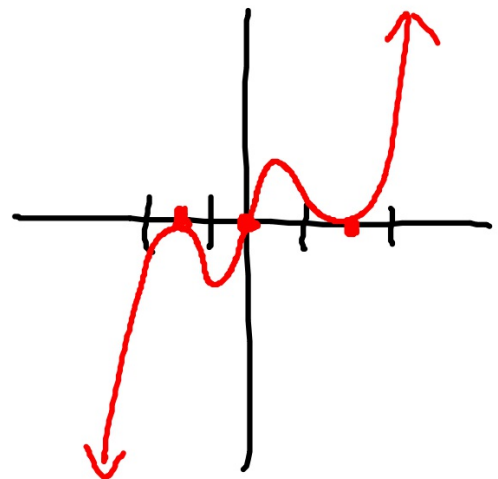
$$x(x^4 - 6x^2 + 9) = 0$$

$$x(x^2 - 3)(x^2 - 3) = 0$$

$$x = 0, \pm\sqrt{3}, \pm\sqrt{3}$$

$$x = 0, \sqrt{3}(\text{DR}), -\sqrt{3}(\text{DR})$$

y-int + (0,0)

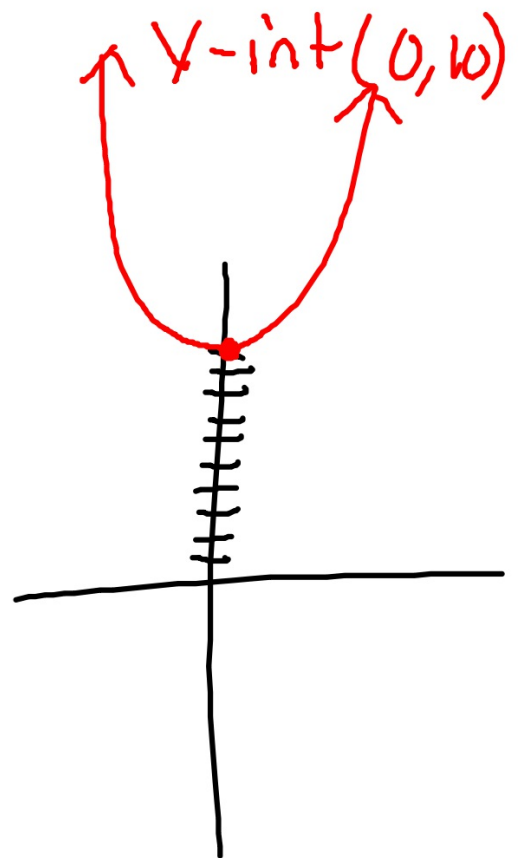


34) $y = 5x^4 + 15x^2 + 10 = 0$

$$5(x^4 + 3x^2 + 2) = 0$$

$$5(x^2 + 2)(x^2 + 1) = 0$$

$$x = \pm i\sqrt{2}, \pm i$$



④

$$x^3 + 3x^2 - 4x - 12 = 0$$

$$(x^3 + 3x^2) + (-4x - 12) = 0$$

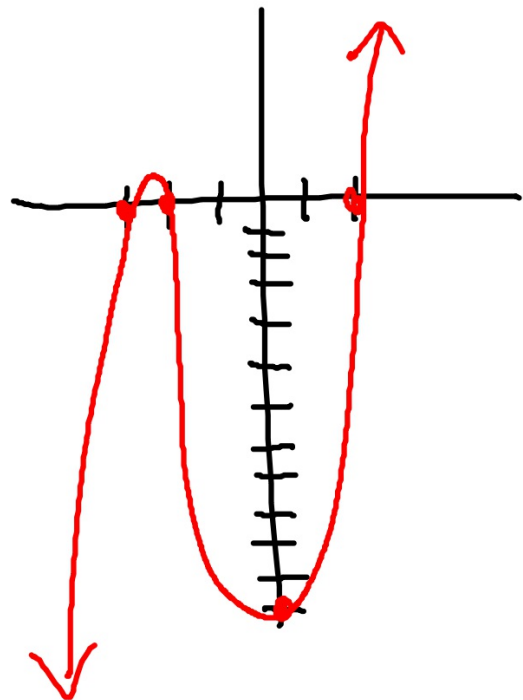
$$x^2(x+3) - 4(x+3) = 0$$

$$(x^2 - 4)(x+3) = 0$$

$$(x-2)(x+2)(x+3) = 0$$

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

y-int: (0, -12)



148 # 1-8, 27-30, 32-40 even