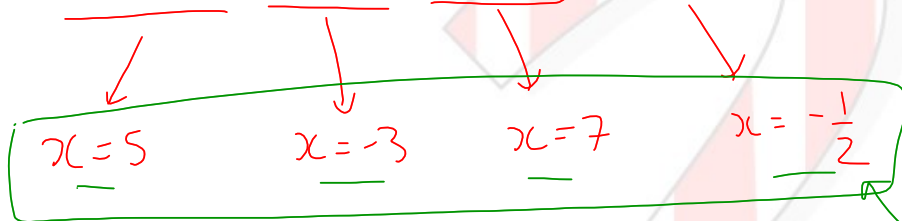


Polynomial Equations

$$(x-5)^2 \cdot (x+3) \cdot (x-7) \cdot (2x+1) = 0$$



$x=5$

$x=-3$

$x=7$

$x=-\frac{1}{2}$

Solutions

$$2x+1=0$$

$$-1 \quad -1$$

$$\frac{2x}{2} = \frac{-1}{2}$$

$x = -\frac{1}{2}$

Ex #2 solve $x^4 - 4x^3 + x^2 + 6x = 0$

Factors

$$x(x^3 - 4x^2 + x + 6) = 0$$

x

$P(1) = 1 - 4 + 1 + 6 \dots$ Nope

$P(-1) = -1 - 4 - 1 + 6$ ✓ ZERO

$x+1$

$(x+1)$

$$\begin{array}{r|rrrr} -1 & 1 & -4 & 1 & +6 \\ & \downarrow & -1 & 5 & -6 \\ \hline & 1 & -5 & 6 & 0 \end{array}$$

$(x-3)(x-2)$

$1x^2 - 5x + 6$

$(x-3)(x-2)$

$x^4 - 4x^3 + x^2 + 6x = 0$

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

Answers: $x=0, -1, 3, 2$



$$x^4 - 4x^3 + x^2 + 6x = 0$$

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

$$\rightarrow f(x) = x^4 - 4x^3 + x^2 + 6x$$

Graph

$$\rightarrow f(x) = x(x+1)(x-3)(x-2)$$

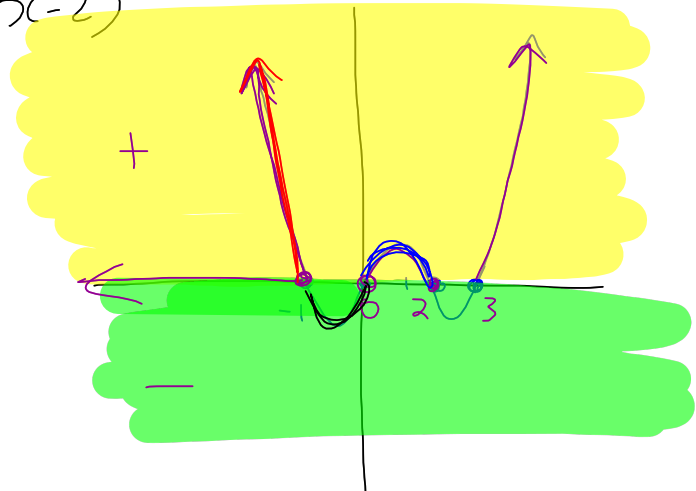
DEGREE : 4

Lead. Coeff : +1 Pg 109

x-int: 0, -1, 3, 2

End Behavior \rightarrow Both up

y-intercept - 0



$f(x)$ is positive
or $f(x) > 0$ when:

$$x < -1$$

$$0 < x < 2$$

$$x > 3$$

$f(x) < 0$ when

$$-1 < x < 0 \text{ or } 2 < x < 3$$

$$y = -3(x-5)(x-2)(x+7)$$

DEGREE: 3

END BEHAVIOR: *start high end low*

x-int: 5, 2, -7

y-int:

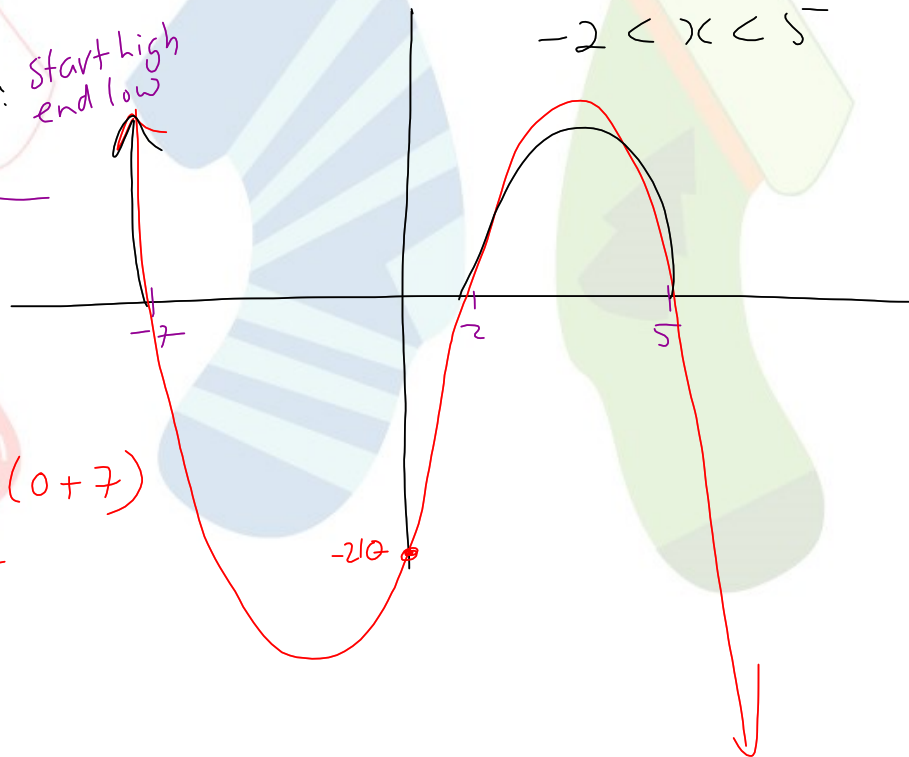
Pos/Neg:

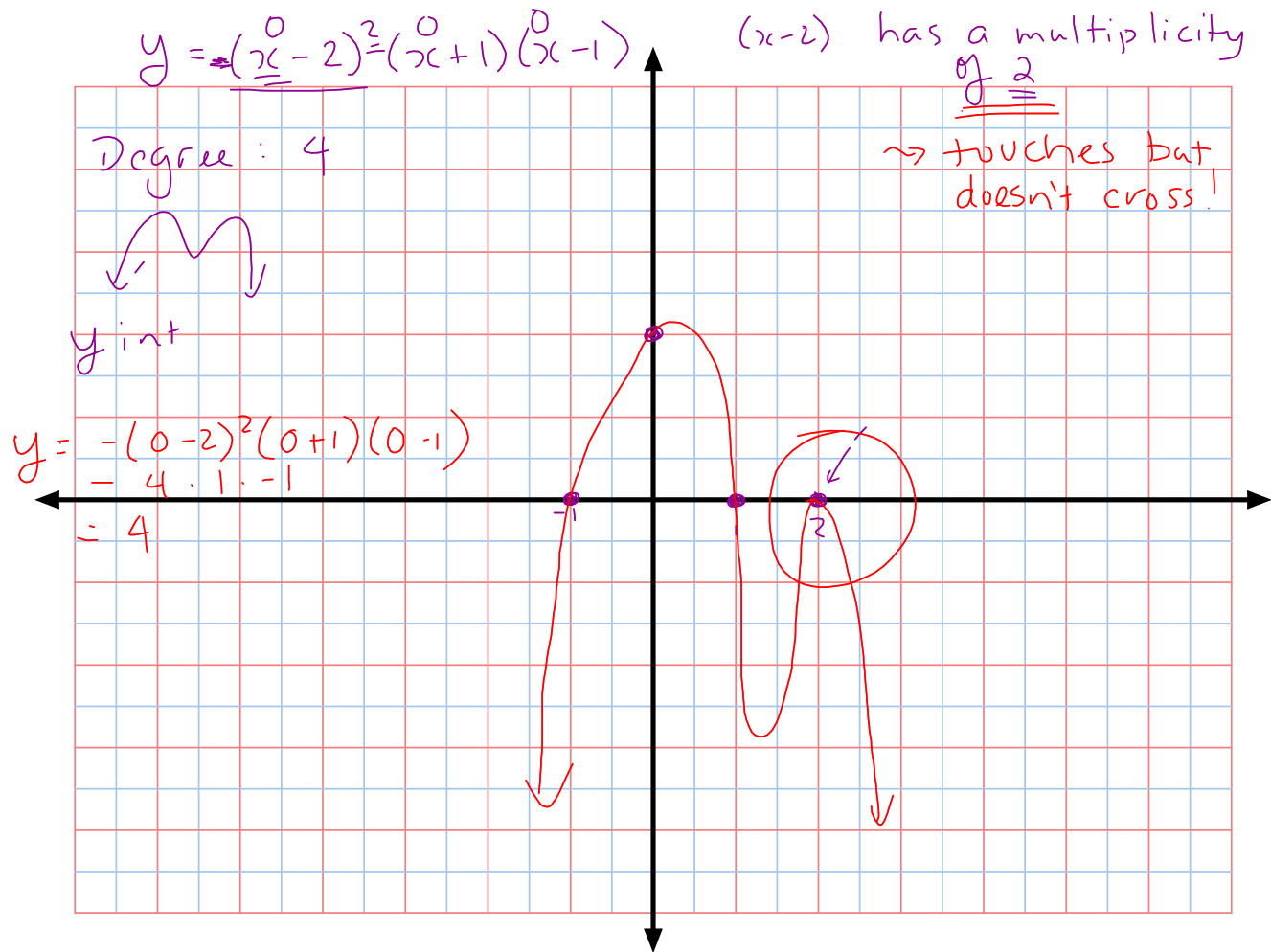
$x < -7$
 $-2 < x < 5$

$$-3(0-5)(0-2)(0+7)$$

$$-3 \cdot -5 \cdot -2 \cdot 7$$

$$-210$$





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

$x + 1$ has a multiplicity of 3

y int:
 $(0 - 3)(0 + 1)^3$
 -3

