

Factoring to find x -int ^{5.1-5.3}

$$\textcircled{1} \quad y = 2x^3 - 9x^2 - 5x$$

$$y = x(2x^2 - 9x - 5)$$

$$y = x(2x + 1)(x - 5)$$

$\begin{array}{r} +1x \\ -10x \\ \hline -9x \end{array}$

Factoring to find x -int ^{5.1-5.3}

① $y = 2x^3 - 9x^2 - 5x$

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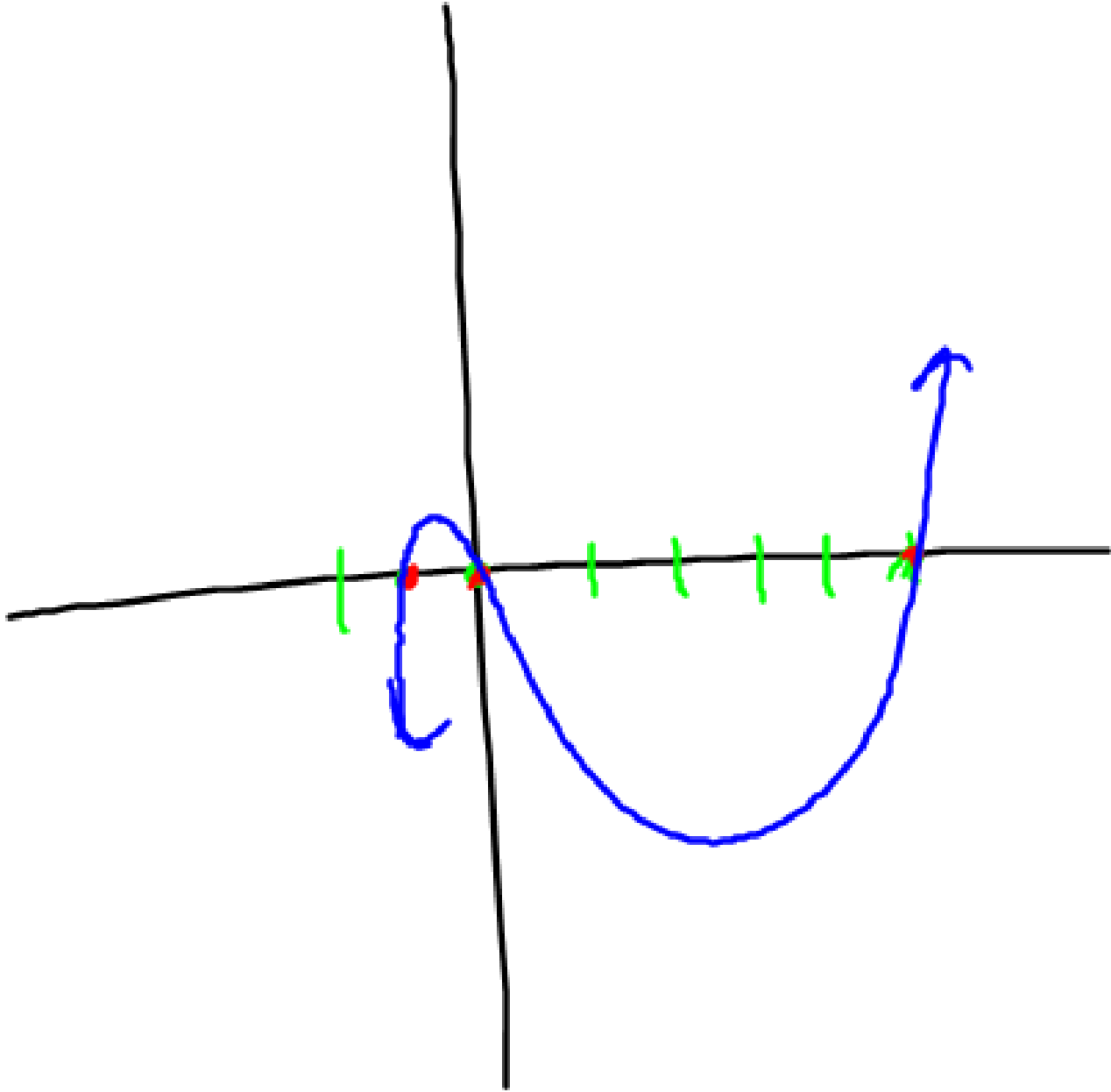
$y = x(2x + 1)(x - 5)$

$\begin{array}{r} +1x \\ -10x \\ \hline -9x \end{array}$

x -int = 0,
 $-\frac{1}{2}, 5$

y -int = 0

end beh:
down, up



②

$$y = -2x^3 + 50x$$

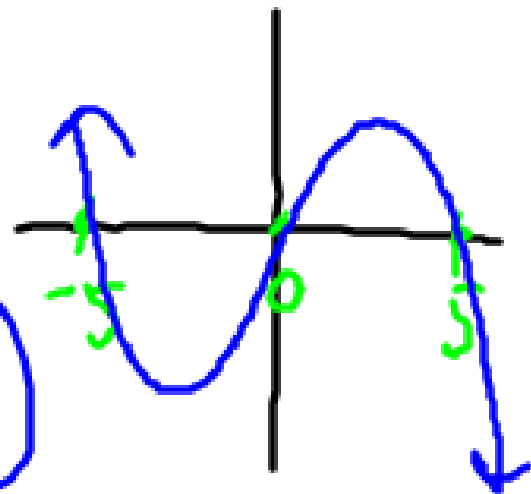
$$y = -2x(x^2 - 25)$$

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

$$x\text{-int} = 0, -5, 5$$

$$y\text{-int} = 0$$

end beh = $\begin{matrix} \uparrow \\ \text{down} \end{matrix}$



③

$$y = x^4 - 3x^2 - 10$$

Think

$$y = x^2 - 3x - 10$$

$$y = (x^2 + 2)(x^2 - 5)$$

$+2x^2$
 $-5x^2$

 $-3x^2$

$$y = (x^2 + 2)(x^2 - 5)$$

end beh
 x^4
vp, vp

x-int:

$$x^2 + 2 = 0$$

$$x^2 - 5 = 0$$

$$-2 \quad -2$$

$$\sqrt{x^2 = -2}$$

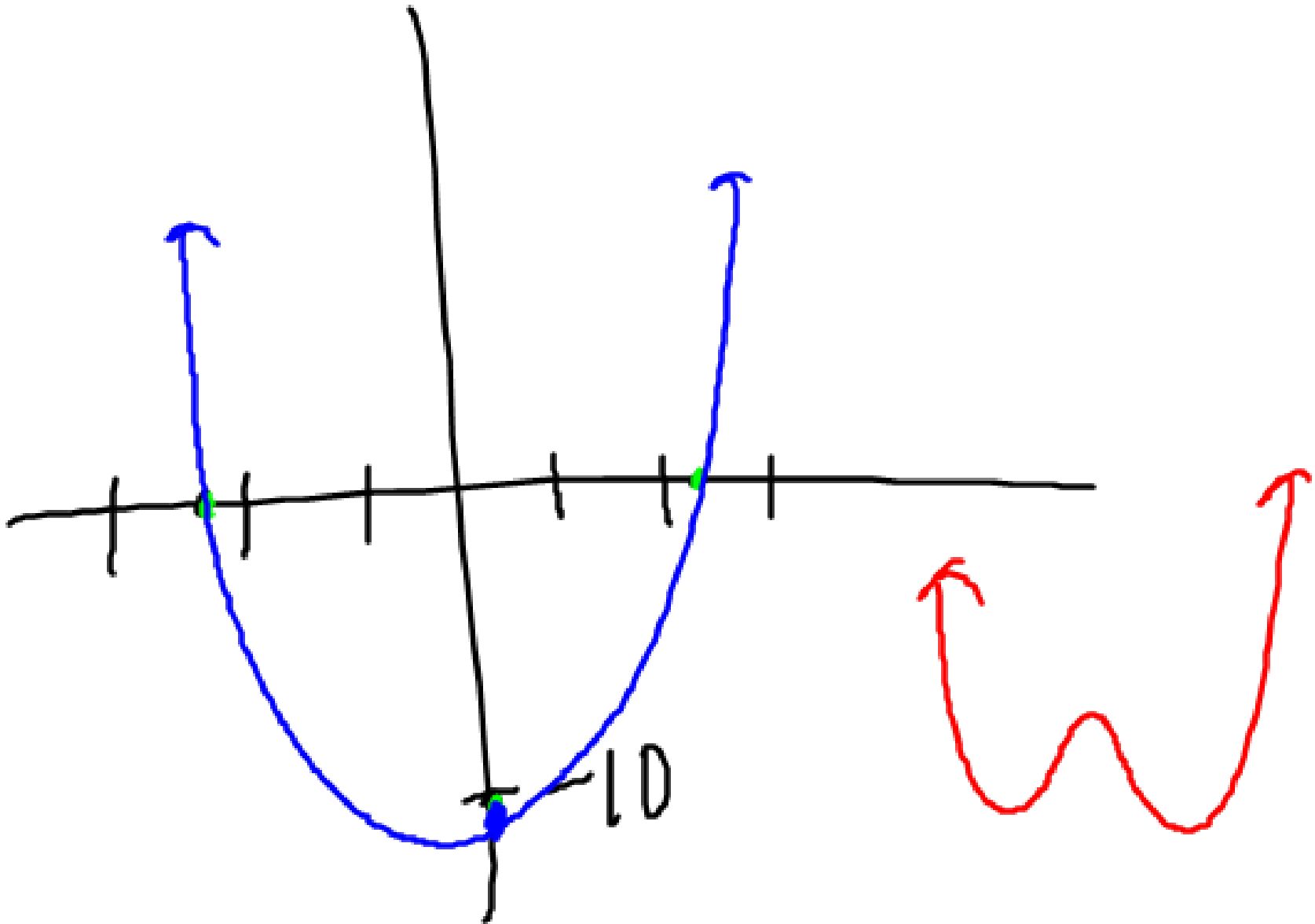
$$x = \pm \sqrt{2} i$$

$$\sqrt{x^2 = 5}$$

$$x = \pm \sqrt{5}$$

$$x \approx \pm 2.23$$

y-int = -10



④ Factor by grouping

$$\begin{aligned} & \textcircled{4} \quad xA + 5A \\ & \quad \quad A(x+5) \end{aligned}$$

$$\begin{aligned} & \textcircled{5} \quad x(2x+3) + 5(2x+3) \\ & \quad \quad (2x+3)(x+5) \end{aligned}$$

$$\textcircled{b} \quad x^2(x+4) - 9(x+4)$$

$$(x+4)(x^2-9)$$

$$y = (x+4)(x+3)(x-3)$$

$$\textcircled{7} \quad y = \underbrace{x^3 - 2x^2} + \underbrace{4x - 8}$$

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

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

$$\textcircled{8} y = \underbrace{4x^3 - 12x^2}_{\text{green}} - \underbrace{9x + 27}_{\text{red}}$$

$$y = 4x^2(x-3) - 9(x-3)$$

$$y = (x-3)(4x^2-9)$$

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