

$$\textcircled{1} \quad 4x^2 = 3$$

$$x^2 = \frac{3}{4}$$

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

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

$$a=4, b=0, c=-3$$

$$b^2 - 4ac = 0^2 - 4(4)(-3) = 48$$

$$\leadsto \sqrt{4ac} = \sqrt{3 \cdot 16} = 4\sqrt{3}$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$= \frac{0 \pm 4\sqrt{3}}{2(4)} = \pm \frac{\sqrt{3}}{2}$$

$$\textcircled{5} \quad 6x^2 - 5x + 3$$

$$a=6, b=-5, c=3$$

$$b^2 - 4ac = (-5)^2 - 4(6)(3)$$

$$= 25 - 72$$

$$= -47 \leadsto \sqrt{-47} = i\sqrt{47}$$

$$x = \frac{5 \pm i\sqrt{47}}{2(6)} = \frac{5 \pm i\sqrt{47}}{12}$$

$$\frac{24}{72}$$

$$\textcircled{2} \quad x^2 - 5x - 6 = 0$$

$$b^2 - 4ac = (-5)^2 - 4(1)(-6)$$

$$= 25 + 24$$

$$= 49 > 0$$

2 real sol'ns

$49 = 7^2 \Rightarrow$ 2 RATIONAL
Solutions.

$$x^2 + 5x + 11 = 0$$

$$b^2 - 4ac$$

$$= 5^2 - 4(1)(11)$$

$$= 25 - 44$$

$$= -19$$

2 nonreal sol'ns

$$x = \frac{-5 \pm i\sqrt{19}}{2}$$

$$x^2 - 10x - 17 = 0$$

$$x^2 - 10x + 5^2 = 17 + 25$$

$$(x-5)^2 = 42$$

$$x-5 = \pm\sqrt{42}$$

$$\sqrt{(x-5)^2} = \sqrt{42}$$

$$|x-5| = \sqrt{42}$$

$$x^2 - 10x - 17$$

$$= x^2 - 10x + 5^2 - 25 - 17$$

$$= (x-5)^2 - 42 \stackrel{\text{SET}}{=} 0$$

$$x^2 - 10x - 17$$

$$= \boxed{(x-5)^2 - 42} \stackrel{\text{SET}}{=} 0 \text{ etc.}$$

v.i.g

$$-\frac{b}{2a} = 5 \neq$$

$$f(5) = 42$$

$$\textcircled{4} \textcircled{a} \quad y = \frac{4}{3}(x-11) + 7$$

$$\textcircled{b} \quad y = -\frac{3}{4}(x-11) + 7$$

$$\textcircled{5} \textcircled{a} \quad |3x+7| \geq 9$$

$$3x+7 \geq 9 \quad \text{OR} \quad 3x+7 \leq -9$$

$$3x \geq 2 \quad \text{OR} \quad 3x \leq -16$$

$$\left\{ x \mid x \geq \frac{2}{3} \quad \text{OR} \quad x \leq -\frac{16}{3} \right\}$$

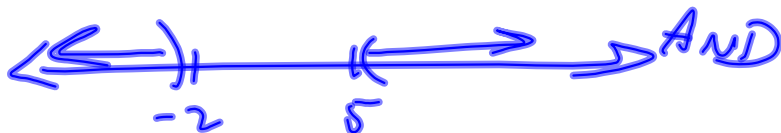
$$= (-\infty, -\frac{16}{3}] \cup [\frac{2}{3}, \infty)$$

$$\textcircled{b} \quad |2x-3| < -7 \quad \emptyset$$

$$2x-3 < -7 \quad \text{and} \quad 2x-3 > 7$$

$$2x < -4 \quad \text{and} \quad 2x > 10$$

$$\left\{ x \mid x < -2 \quad \text{and} \quad x > 5 \right\} = \emptyset$$



$$= \emptyset$$

③ CPT : Conjugate Pairs Theorem

$$(x-1)^2(x+7)(x-(2-3i))(x-(2+3i))$$

⑥ $\frac{1}{6}x + \frac{1}{4}x = 1$ LCD = 12

$$2x + 3x = 12$$

$$5x = 12$$

$$x = \frac{12}{5} = 2.4$$

$$\frac{4}{10} \cdot \frac{60 \text{ min}}{\text{hr}} = 24 \text{ min}$$

2 hrs 24 min

5 + 2

⑦

2)	3	-2	0	5	-11
		6	8	16	42
	3	4	8	21	31 = P(2)

$$\begin{aligned}
 & \textcircled{9} \quad (x - (4+7i))(x - (4-7i)) \\
 &= x^2 - (4-7i)x - (4+7i)x + (4+7i)(4-7i) \\
 &= x^2 - 4x + 7ix - 4x - 7ix + \underline{(16 - 49i^2)} \\
 &= x^2 - 8x + 65 \quad \leftarrow \begin{array}{l} \text{16+49} \\ = 65 \end{array} \\
 & \left((x-4) + 7i \right) \left((x-4) - 7i \right) \\
 & (x-4)^2 - (7i)^2 \\
 &= x^2 - 8x + 16 - (49i^2) \\
 &= x^2 - 8x + 16 - (-49) =
 \end{aligned}$$

$$y = \frac{2x-4}{x+1}$$

$$D = \mathbb{R} \setminus \{-1\}$$

$x = -1$ is V.A.

$$y=0: 2x=4$$

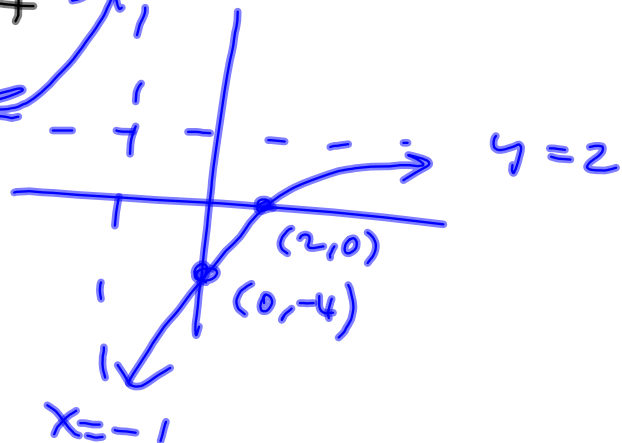
$$x=2$$

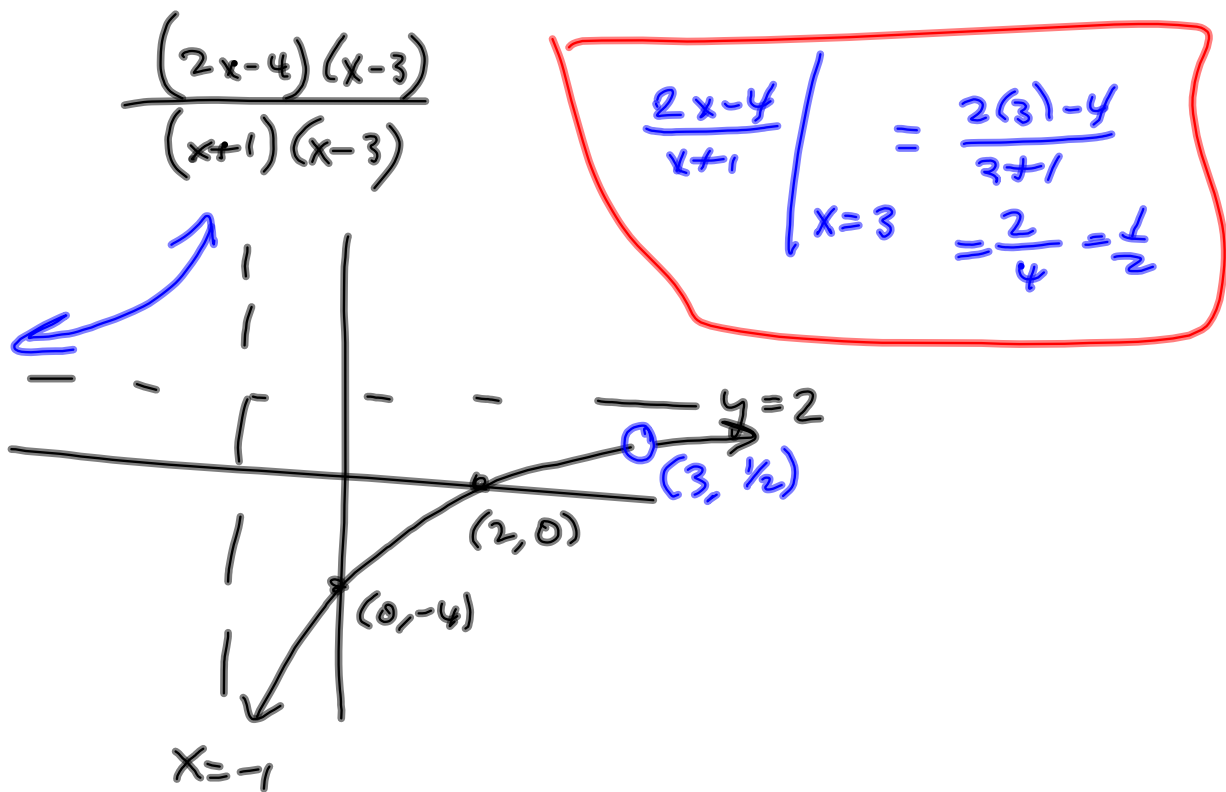
$(2,0)$ x- \ddot{u} t

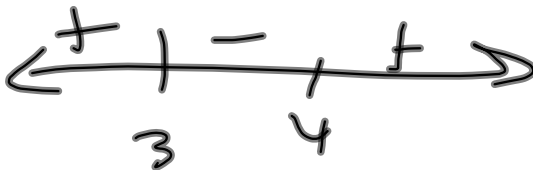
$(0,-4)$ is y- \ddot{u} t

$$\frac{2x}{x} = 2 = y$$

H.A.





$$x^2 - 7x + 12 > 0$$
$$(x-4)(x-3) > 0$$


3 4

$$(-\infty, 3) \cup (4, \infty)$$

$$f(x) = \frac{x-3}{x-5}, \quad g(x) = \sqrt{x-7}$$

$$f(g(x)) = \frac{\sqrt{x-7}-3}{\sqrt{x-7}-5}$$

$$\begin{aligned} \mathcal{D}(g) &= [7, \infty) \\ \mathcal{D}(f) &= \mathbb{R} \setminus \{5\} \end{aligned}$$

$$\mathcal{D} = \{x \mid x \in \mathcal{D}(g) \text{ and } g(x) \in \mathcal{D}(f)\}$$

$$= \{x \mid x \geq 7 \text{ and } \sqrt{x-7} \neq 5\}$$

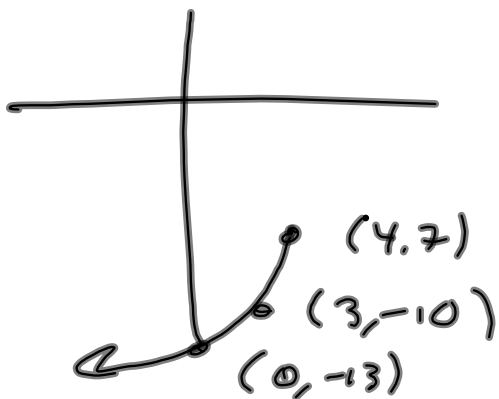
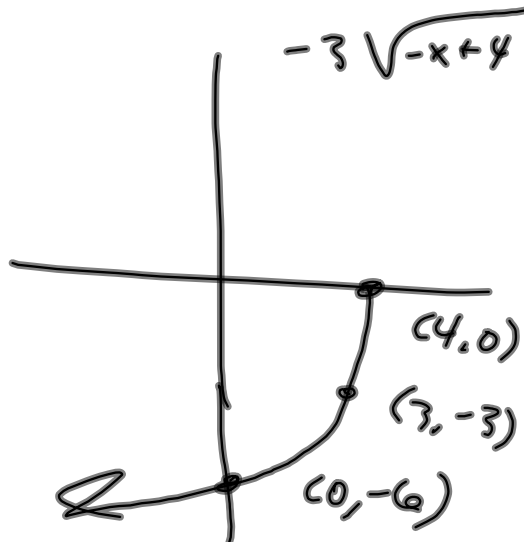
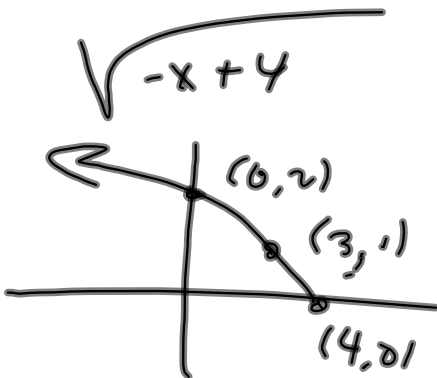
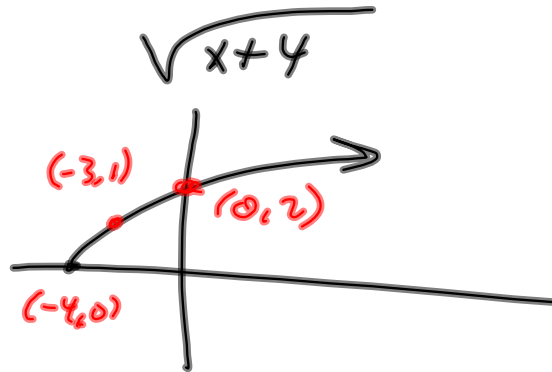
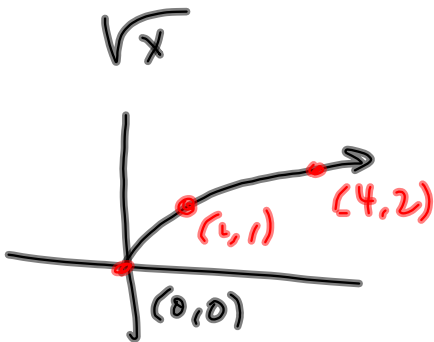
$$= \{x \mid x \geq 7 \text{ and } x \neq 32\}$$

$$\sqrt{x-7} = 5$$

$$[7, 32) \cup (32, \infty)$$

$$x-7 = 25$$

$$x = 32$$



(a) $(x-2)^2 (x+5)^3 (x-\sqrt{2}) (x+\sqrt{2}) \leq 0$

$(-\infty, -5] \cup [-\sqrt{2}, \sqrt{2}] \cup \{2\}$

Daren the man!

(b) $\frac{(x-\sqrt{2})(x+\sqrt{2})}{(x-2)^2(x+5)^3} \leq 0$

$(-\infty, -5) \cup [-\sqrt{2}, \sqrt{2}]$

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

$$\frac{f(x+h) - f(x)}{h} = \frac{(x+h)^3 - 2(x+h) - [x^3 - 2x]}{h}$$

$$= \frac{x^3 + 3x^2h + 3xh^2 + h^3 - 2x - 2h - x^3 + 2x}{h}$$

$$= \frac{3x^2h + 3xh^2 + h^3 - 2h}{h}$$

$$= \frac{h [3x^2 + 3xh + h - 2]}{h} = 3x^2 + 3xh + h - 2$$

$$h \rightarrow 0 \rightarrow 3x^2 - 2$$

Mega Bonus!

$$\textcircled{d} \quad \frac{1}{6}(x-1) + \frac{1}{4}x = 1$$

$$2(x-1) + 3x = 12$$

$$2x-2 + 3x = 12$$

$$5x = 14$$

$$x = \frac{14}{5} = 2.8$$

= 2 hrs 48 min

$$\frac{1}{6}x + \frac{1}{4}(x+1) = 1$$

Master the concepts

Final fixes all.

$$2x + 3(x+1) = 12$$

$$2x + 3x + 3 = 12$$

$$5x = 9$$

$$x = \frac{9}{5}$$

$$x+1 = \text{Isamar's time}$$

$$= \frac{9}{5} + \frac{5}{5} = \frac{14}{5}, \text{ etc.}$$