

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

#68

1) Quad. linear

$$-5a^2 - 2a + 51 = -4a$$

$$-5a^2 + 2a + 51 = 0$$

$$a = -5$$

$$b = 2$$

$$c = 51$$

$$b^2 - 4ac$$

$$2^2 - 4(-5)(51)$$

$$4 + 1020$$

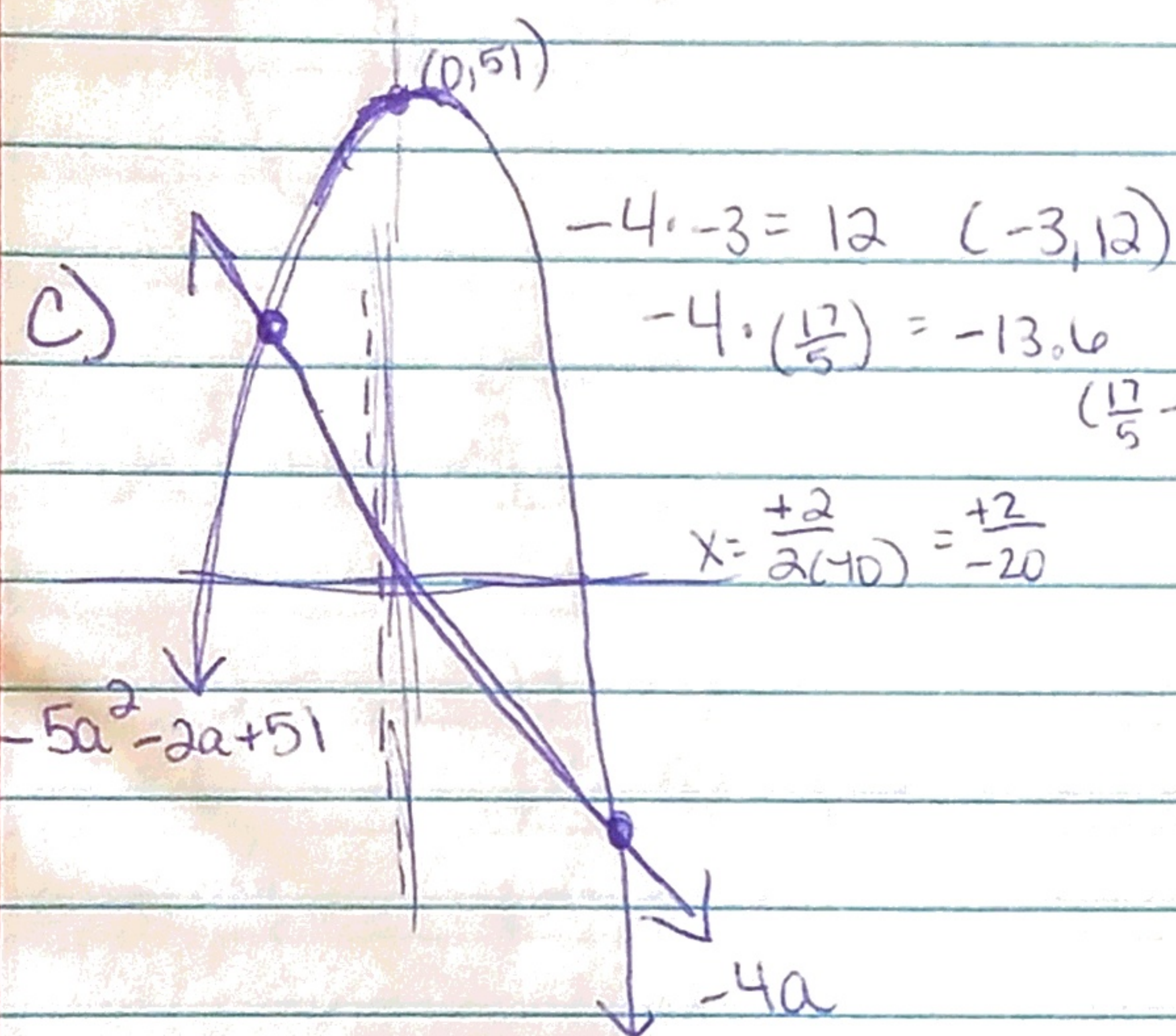
$$1024$$

$$x = \frac{-2 \pm \sqrt{1024}}{2(-5)} \Rightarrow \frac{-2 \pm 32}{-10}$$

$$x = \frac{-2 + 32}{-10} \quad \text{or} \quad x = \frac{-2 - 32}{-10}$$

$$x = \frac{30}{-10} \quad x = \frac{-34}{-10}$$

$$x = -3 \quad x = \frac{17}{5}$$



2)

$$8x^2 + 2x - 15 = 0$$

$$a = 8$$

$$b = 2$$

$$c = -15$$

$$b^2 - 4ac$$

$$2^2 - 4(8)(-15)$$

$$4 + 480$$

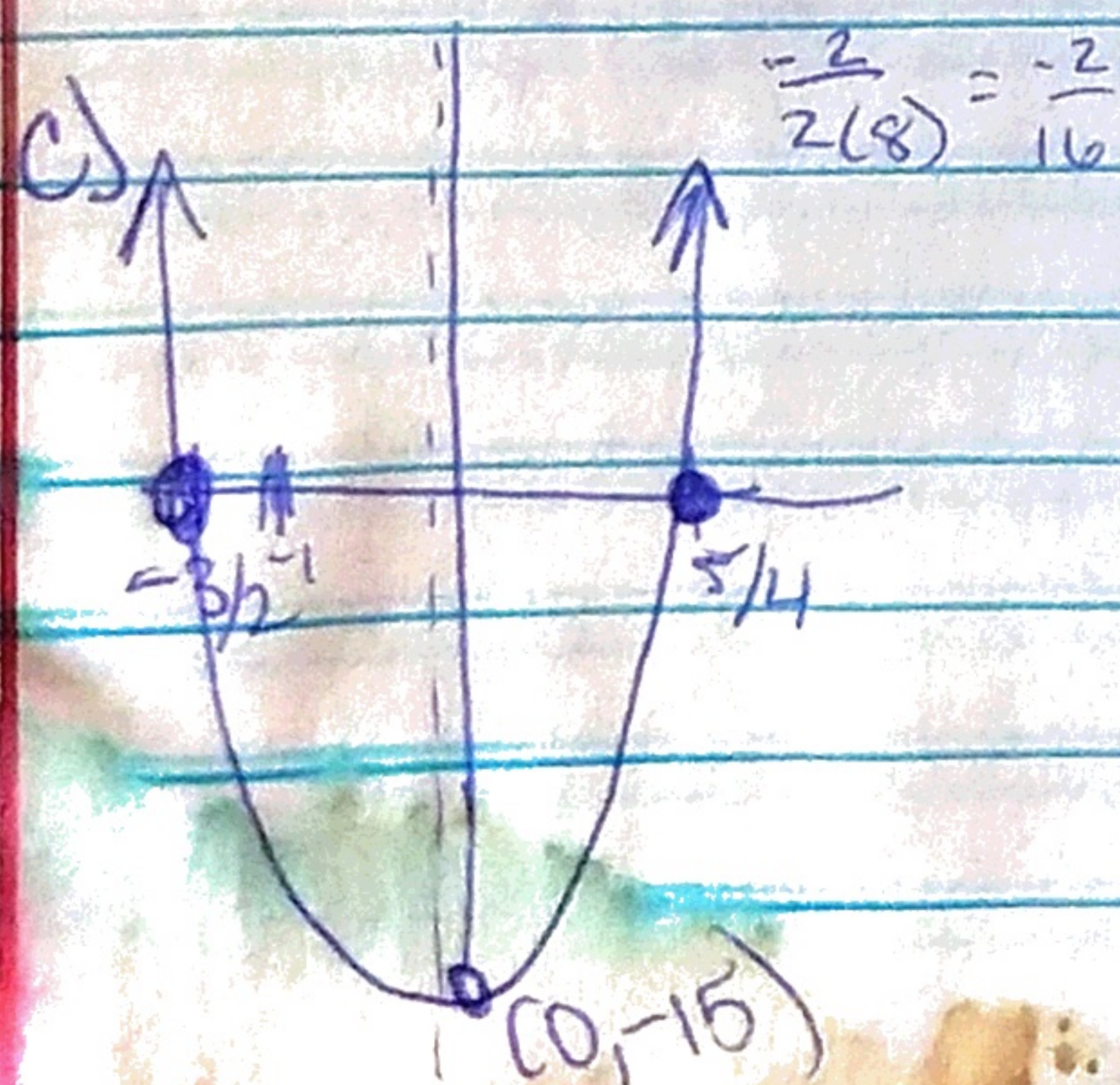
$$484$$

$$x = \frac{-2 \pm \sqrt{484}}{2(8)} \Rightarrow \frac{-2 \pm 22}{16}$$

$$x = \frac{-2 + 22}{16} \quad \text{or} \quad x = \frac{-2 - 22}{16}$$

$$x = \frac{20}{16} \quad x = \frac{-24}{16}$$

$$x = \frac{5}{4} \quad x = -\frac{3}{2}$$



$\swarrow$  Quad  $\swarrow$  zero  
 ③  $5x^2 + 23x + 12 = 0$

a) finding x intercepts

$a = 5$        $b^2 - 4ac$   
 $b = 23$        $23^2 - 4(5)(12)$   
 $c = 12$        $529 - 240$   
                   289

$x = \frac{-23 \pm \sqrt{289}}{2(5)} \Rightarrow \frac{-23 \pm 17}{10}$

$x = \frac{-23+17}{10}$     or     $x = \frac{-23-17}{10}$

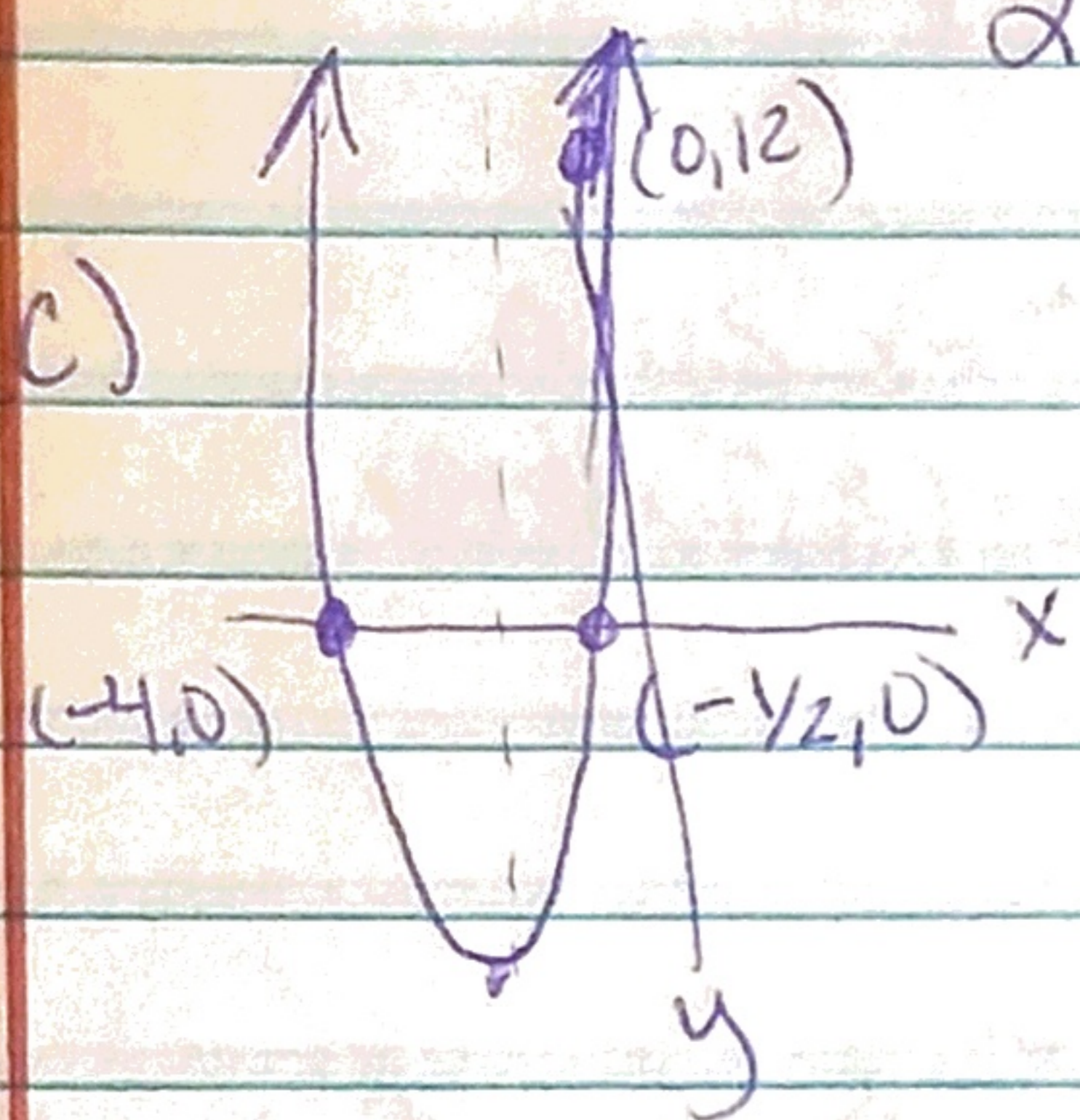
$x = \frac{-5}{10}$

$x = \frac{-40}{10}$

b)  $\rightarrow$

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

$x = -4$



$\swarrow$  Quad  $\swarrow$  zero  
 ④  $10x^2 + x - 9 = 0$

a) finding x int

$a = 10$        $b^2 - 4ac$   
 $b = 1$        $1^2 - 4(10)(-9)$   
 $c = -9$        $1 + 360$   
                   361

$x = \frac{-1 \pm \sqrt{361}}{2(10)} \Rightarrow \frac{-1 \pm 19}{20}$

$x = \frac{-1+19}{20}$     or     $x = \frac{-1-19}{20}$

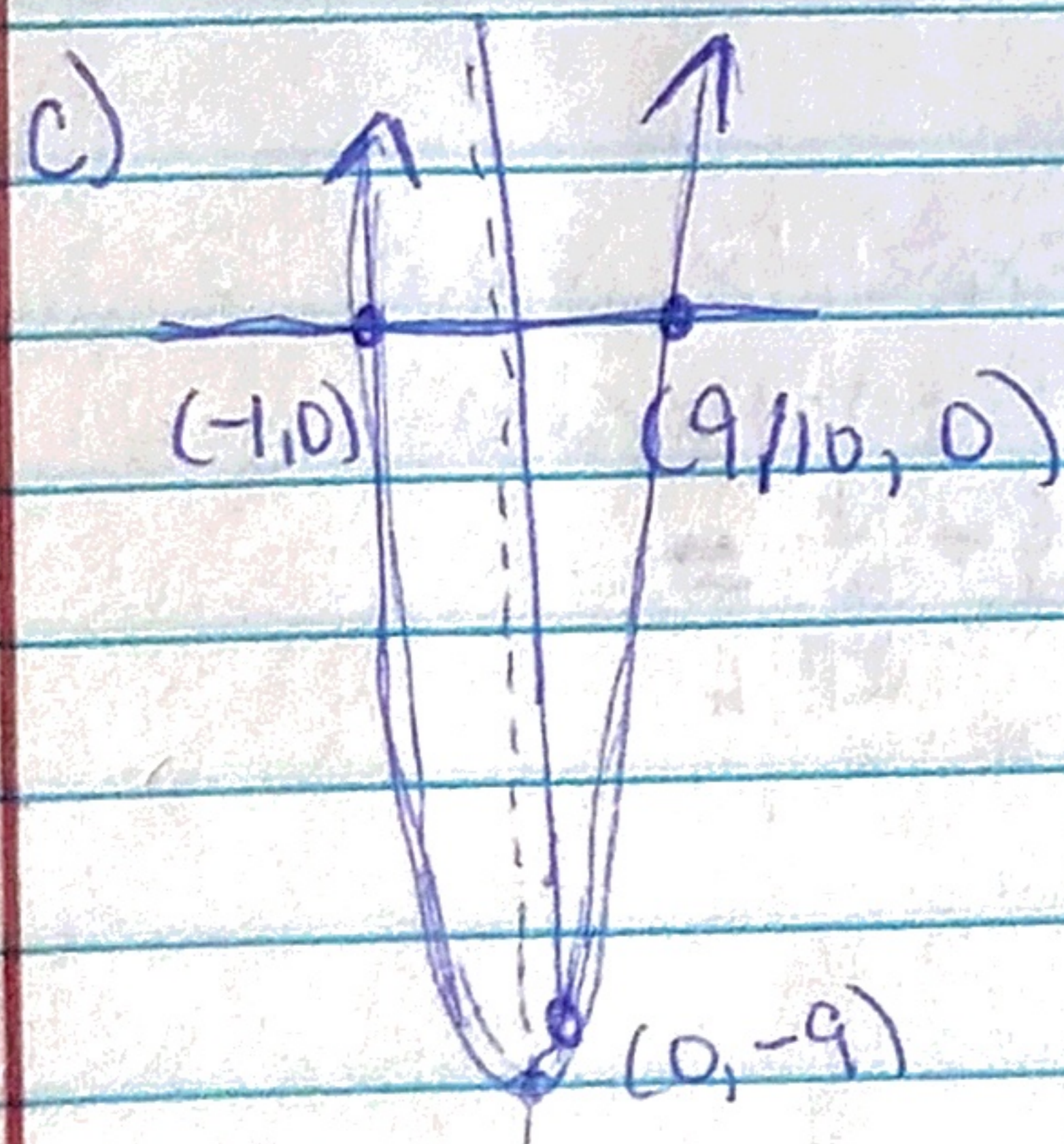
$x = \frac{18}{20}$

$x = \frac{-20}{20}$

b)  $\rightarrow$

$x = \frac{9}{10}$

$x = -1$



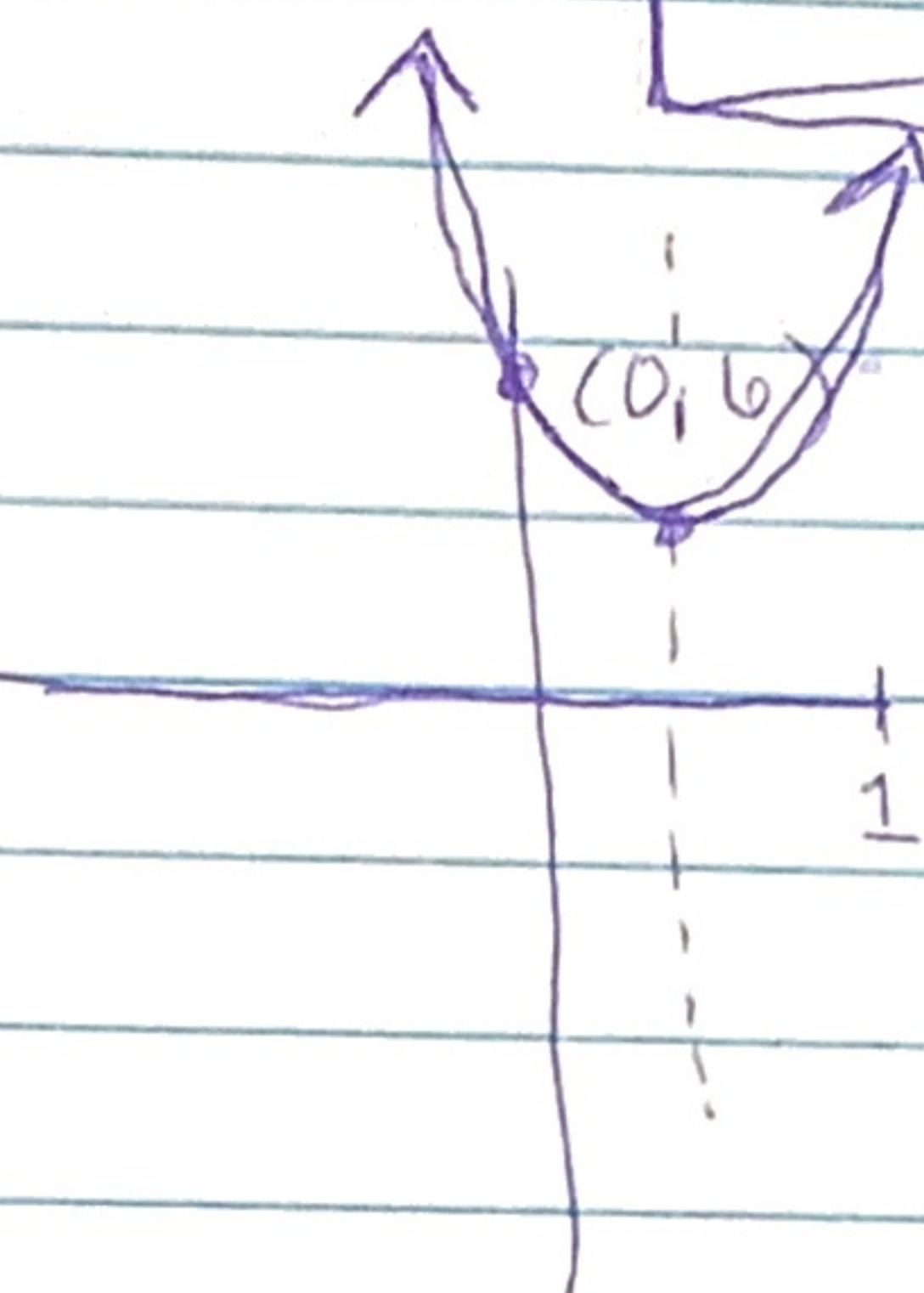
⑤  $10x^2 - 9x + 6 = 0$  ↙ Quad ↘ zero

$a = 10$        $b^2 - 4ac$   
 $b = -9$        $(-9)^2 - 4(10)(6)$   
 $c = 6$          $81 - 240$   
                   $-159$

$x = \frac{+9 \pm \sqrt{-159}}{2(10)} \Rightarrow \frac{9 \pm i\sqrt{159}}{20} \leftarrow (b)$

a) finding x intercepts

A.O.S.  $x = \frac{+9}{2(10)} = \frac{9}{20}$   
 Vertex:  $f(\frac{9}{20}) = 10(\frac{9}{20})^2 - 9(\frac{9}{20}) + 6$   
                   $\approx 2 - 4 + 6$   
                   $\approx 4$



⑥  $6k^2 + 2k + 9 = -3$  ↙ Quad ↘ const.

$+3$      $+3$

$6k^2 + 2k + 12 = 0$

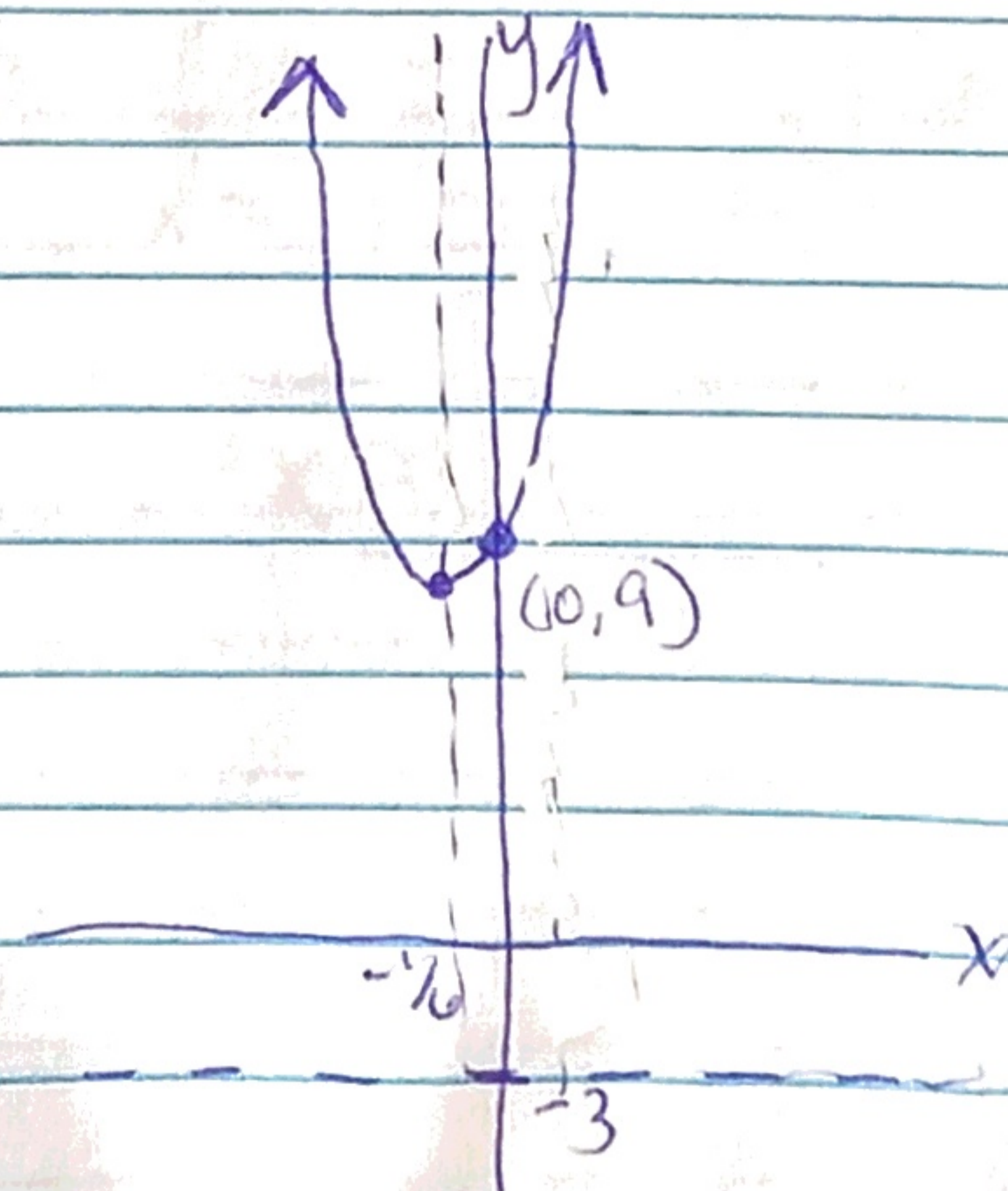
a) finding where a quadratic intersects a horizontal line

$a = 6$        $b^2 - 4ac$   
 $b = 2$        $2^2 - 4(6)(12)$   
 $c = 12$       $4 - 288$   
                   $-284$

$x = \frac{-2 \pm \sqrt{-284}}{2(6)} \Rightarrow \frac{-2 \pm \sqrt{4 \cdot -71}}{12} \Rightarrow \frac{-2 \pm 2i\sqrt{71}}{12}$

$\frac{2}{12}$  reduces  $\frac{1}{6}$  to  $\frac{1}{6}$   $x = \frac{-1 \pm i\sqrt{71}}{6} \leftarrow (b)$

A.O.S.  $x = \frac{-2}{2(6)} \Rightarrow \frac{-2}{12}$   
 $f(-\frac{1}{6}) = 6(-\frac{1}{6})^2 + 2(-\frac{1}{6}) + 9$   
                   $= \frac{1}{6} - \frac{2}{6} + \frac{54}{6}$   
                   $= \frac{53}{6}$  or  $8\frac{5}{6}$

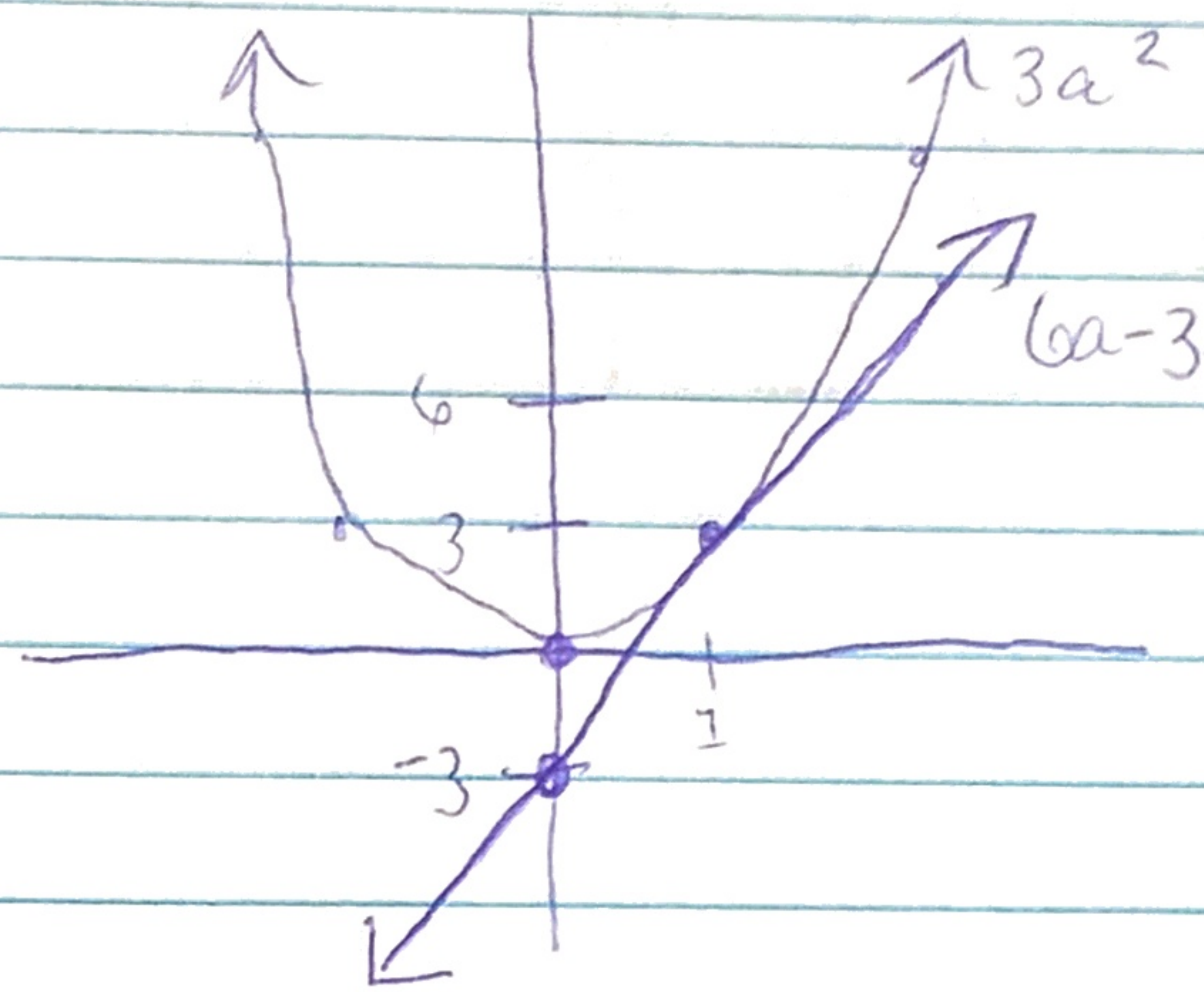


$$\begin{array}{l} \text{Quad} \quad \text{Linear} \\ \textcircled{7} \quad 3a^2 = (6a - 3) \\ \quad \quad \quad -6a + 3 \quad -6a + 3 \end{array}$$

$$3a^2 - 6a + 3 = 0$$

$$\begin{array}{l} a=3 \quad b^2 - 4ac \\ b=-6 \quad (-6)^2 - 4(3)(3) \\ c=3 \quad 36 - 36 \\ \quad \quad \quad 0 \end{array}$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \Rightarrow \frac{6 \pm 0}{6} \Rightarrow \boxed{x=1} \leftarrow (b)$$



$$\begin{array}{l} \text{Quad} \quad \text{Linear} \\ \textcircled{8} \quad 4a^2 - 8 = a \\ \quad \quad \quad -a \quad -a \end{array}$$

$$4a^2 - a - 8 = 0$$

$$\begin{array}{l} a=4 \quad b^2 - 4ac \\ b=-1 \quad (-1)^2 - 4(4)(-8) \\ c=-8 \quad 1 + 128 \\ \quad \quad \quad 129 \end{array}$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \Rightarrow \frac{-1 \pm \sqrt{129}}{8} \leftarrow (b)$$

exact

$$x \approx \frac{-1 + 11.36}{8} \quad \leftarrow \quad x \approx \frac{-1 - 11.36}{8}$$

$$\boxed{x \approx 1.3} \quad \quad \quad \boxed{x \approx -1.5}$$

