

Review for Test:

$$y = \frac{24}{x}$$

① Solve by factoring:

$$3x^2 + 8 = 10x$$

$$\begin{array}{r} -10x \quad -10x \\ \hline \end{array}$$

Split
the
Middle

$$3x^2 - 10x + 8 = 0$$

$$3x^2 - 6x - 4x + 8 = 0$$

$$ac = 24$$

$$b = -10$$

$$\begin{array}{r} \wedge \\ -6 \quad -4 \end{array}$$

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

$$(x-2) | (3x-4) = 0$$

$$\begin{array}{r} x-2=0 \quad | \quad 3x-4=0 \end{array}$$

$$x = 2$$

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

② Solve by C.T.S. Move
constant

$$2x^2 + 14x - 22 = 0$$

∴ by
"a"

$$\frac{2x^2 + 14x = 22}{2}$$

$$\left(\frac{7}{2}\right)^2 = \frac{49}{4}$$

$$x^2 + 7x + \frac{49}{4} = 11 + \frac{49}{4}$$

$$\sqrt{\left(x + \frac{7}{2}\right)^2} = \sqrt{\frac{93}{4}}$$

$$x + \frac{7}{2} = \pm \frac{\sqrt{93}}{2}$$

$$x = -\frac{7}{2} \pm \frac{\sqrt{93}}{2}$$

$$x = \frac{-7 \pm \sqrt{93}}{2}$$

③ C.T.S. to put in vertex form: $y = a(x-h)^2 + k$

$$\cancel{y} f(x) = 2x^2 + 14x - 22$$

$$\begin{array}{r} +22 \\ +22 \end{array}$$

$$y + 22 = 2x^2 + 14x$$

$$\frac{y}{2} + 11 + \frac{49}{4} = x^2 + 7x + \frac{49}{4}$$

$$\frac{y}{2} + \frac{93}{4} = \left(x + \frac{7}{2}\right)^2$$

$$\frac{y}{2} = \left(x + \frac{7}{2}\right)^2 - \frac{93}{4}$$

$$y = 2\left(x + \frac{7}{2}\right)^2 - \frac{93}{2}$$

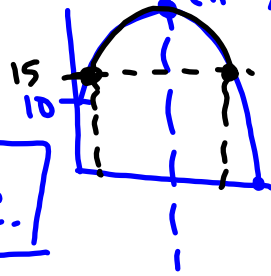
$$V: \left(-\frac{7}{2}, -\frac{93}{2}\right)$$

④ Word Problem Using Quad. Formula

$$h(t) = -16t^2 + 32t + 10$$

a) Max ht.?

$$x = \frac{-b}{2a} = \frac{-32}{2(-16)} = \boxed{1 \text{ sec.}}$$



$$h(1) = -16(1)^2 + 32(1) + 10 = \boxed{26 \text{ ft.}}$$

b) How long is the ball in the air?

$$0 = -16t^2 + 32t + 10$$

$$t = \frac{-32 \pm \sqrt{1664}}{-32}$$

\leftarrow -2.27 reject
 $\boxed{2.27 \text{ sec.}}$

c) What is the interval of time when the ball is greater than 15 ft.?

$$\begin{array}{r} -16t^2 + 32t + 10 > 15 \\ \underline{-15 \quad -15} \\ -16t^2 + 32t - 5 = 0 \end{array}$$

$$t = \frac{-32 \pm \sqrt{704}}{-32}$$

\leftarrow $.17$
 \leftarrow 1.83

From .17 sec. to 1.83 sec. . . .

⑤ Discriminant

Find disc. + describe roots:

$$a) \quad 4x^2 - 5x = 12$$

$$4x^2 - 5x - 12 = 0$$

$$b^2 - 4ac$$

$$(-5)^2 - (4 \cdot 4 \cdot -12) = \textcircled{217}$$

$$25 + 192$$

2 real,
irrational
roots

b) Write the eq'n
so that it has ² imaginary
roots.

$$ax^2 - 8x + c = 0$$

$$b^2 - 4ac < 0 \quad (\text{neg. disc.})$$

$$(-8)^2 - 4ac < 0$$

$$64 - 4ac < 0$$

$$\text{let } \begin{array}{l} a=4 \\ c=5 \end{array}$$

$$\frac{64}{4} < \frac{4ac}{4}$$

$$16 < ac$$

$$ac > 16$$

$$\boxed{ax^2 + bx + c = 0}$$

$$\boxed{4x^2 - 8x + 5 = 0}$$

⑥ System

$$2x^2 - 3x - y = -5$$

$$\begin{array}{r} -x + y = 5 \\ +x \quad +x \end{array}$$

$$y = x + 5$$

$$2x^2 - 3x - (x + 5) = -5$$

$$\begin{array}{r} 2x^2 - 3x - x - 5 = -5 \\ +5 \quad +5 \end{array}$$

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

Factor

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

$$\begin{array}{r|l} 2x=0 & x-2=0 \\ \hline \frac{2}{2} & \frac{x-2}{+2 \quad +2} \\ 2 & \end{array}$$

$$x=0$$

$$x=2$$

$$-0 + y = 5$$

$$y = 5$$

$$(0, 5)$$

$$-2 + y = 5$$

$$\begin{array}{r} +2 \quad +2 \\ \hline y = 7 \end{array}$$

$$(2, 7)$$