

Classwork/ Homework

Pg. 304-305 #17-51 odd

$$17) x^2 - 8x = 3$$

$$x^2 - 8x + (-4)^2 = 3 + (-4)^2$$

$$\sqrt{(x-4)^2} = \sqrt{19}$$

$$x - 4 = \pm \sqrt{19}$$

$$\begin{array}{r} x - 4 = \pm \sqrt{19} \\ +4 \qquad \qquad +4 \\ \hline x = \pm \sqrt{19} + 4 \end{array}$$

$$19) x^2 - 5x - 1 = 4 - 3x$$
$$\begin{array}{r} +3x + 1 \quad +1 + 3x \\ \hline \end{array}$$

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

$$\sqrt{(x-1)^2} = \sqrt{6}$$

$$x - 1 = \pm \sqrt{6}$$

$$\begin{array}{r} x - 1 = \pm \sqrt{6} \\ +1 \qquad \qquad +1 \\ \hline x = \pm \sqrt{6} + 1 \end{array}$$

$$21) \quad 0 = x^2 + 7x - 26$$

$$\frac{-126 \quad + 26}{\quad}$$

$$x^2 + 7x + \left(\frac{7}{2}\right)^2 = 26 + \left(\frac{7}{2}\right)^2$$

$$\left(x + \frac{7}{2}\right)^2 = \frac{104}{4} + \frac{49}{4}$$

$$\sqrt{\left(x + \frac{7}{2}\right)^2} = \sqrt{\frac{153}{4}}$$

$$x + \frac{7}{2} = \pm \frac{\sqrt{153}}{2}$$

$$\frac{-7}{2} \quad \frac{-7}{2}$$

$$x = \frac{\pm \sqrt{153} - 7}{2}$$

$$23) \quad x^2 + 7x + 10 = 0$$

$$\quad \quad \quad -10 \quad -10$$

$$x^2 + 7x + \left(\frac{7}{2}\right)^2 = -10 + \left(\frac{7}{2}\right)^2$$

$$\left(x + \frac{7}{2}\right)^2 = -\frac{40}{4} + \frac{49}{4}$$

$$\sqrt{\left(x + \frac{7}{2}\right)^2} = \sqrt{\frac{9}{4}}$$

$$x + \frac{7}{2} = \pm \frac{3}{2}$$

$$x = \pm \frac{3}{2} - \frac{7}{2}$$

$$x = -2, -5$$

$$25) \quad x^2 - x = 30$$

$$x^2 - x + \left(-\frac{1}{2}\right)^2 = 30 + \left(-\frac{1}{2}\right)^2$$

$\frac{30}{2} + \frac{1}{4}$

$$\sqrt{\left(x - \frac{1}{2}\right)^2} = \sqrt{\frac{121}{4}}$$

$$x - \frac{1}{2} = \pm \frac{11}{2}$$

$+\frac{1}{2} \qquad \qquad \qquad +\frac{1}{2}$

$$x = \pm \frac{11}{2} + \frac{1}{2}$$

$$x = -6, -5$$

$$27) \quad -2x^2 + 14x + 60 = 0$$

$$\quad \quad \quad -60 \quad -60$$

$$\frac{-2x^2 + 14x}{-2} = \frac{-60}{-2}$$

$$x^2 - 7x + \left(\frac{-7}{2}\right)^2 = 30 + \left(\frac{-7}{2}\right)^2$$

$$\left(x - \frac{7}{2}\right)^2 = \frac{120}{4} + \frac{49}{4}$$

$$\sqrt{\left(x - \frac{7}{2}\right)^2} = \sqrt{\frac{169}{4}}$$

$$x - \frac{7}{2} = \pm \frac{13}{2}$$

$$x = \frac{\pm 13 + 7}{2}$$

$$x = 10, -3$$

$$29) -10 = x^2 - 8x + 2$$

$$x^2 - 8x + (-4)^2 = -12 + (-4)^2$$

$$\sqrt{(x-4)^2} = \sqrt{4}$$

$$\begin{array}{r} x-4 = \pm 2 \\ +4 \quad +4 \\ \hline x = \pm 2 + 4 \end{array}$$

$$x = 6, 2$$

$$31) \quad 4 - x^2 = 10x$$

 + x^2 + x^2

$$x^2 + 10x + (5)^2 = 4 + (5)^2$$

$$\sqrt{(x+5)^2} = \sqrt{29}$$

$$x+5 = \pm \sqrt{29}$$

 -5 -5

$$x = -5 \pm \sqrt{29}$$

$$33) \quad \begin{array}{r} 8x - 2 = x^2 + 15x \\ -8x \quad \quad \quad -8x \\ \hline \end{array}$$

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

$$\left(x + \frac{7}{2}\right)^2 = -\frac{8}{4} + \frac{49}{4}$$

$$\sqrt{\left(x + \frac{7}{2}\right)^2} = \sqrt{\frac{41}{4}}$$

$$x + \frac{7}{2} = \pm \frac{\sqrt{41}}{2}$$

$$\begin{array}{r} -\frac{7}{2} \quad -\frac{7}{2} \\ \hline \end{array}$$

$$x = \frac{-7 \pm \sqrt{41}}{2}$$

$$35) \frac{2x^2}{2} = \frac{22x}{2} - \frac{11}{2}$$

$$x^2 = 11x - \frac{11}{2}$$

-11x -11x

$$x^2 - 11x + \left(-\frac{11}{2}\right)^2 = -\frac{11}{2} + \left(-\frac{11}{2}\right)^2$$

$$\left(x - \frac{11}{2}\right)^2 = -\frac{22}{4} + \frac{121}{4}$$

$$\sqrt{\left(x - \frac{11}{2}\right)^2} = \sqrt{\frac{99}{4}}$$

$$x - \frac{11}{2} = \pm \frac{\sqrt{99}}{2}$$

+ $\frac{11}{2}$ + $\frac{11}{2}$

$$x = \frac{\pm \sqrt{99} + 11}{2}$$

$$39) g(x) = -x^2 + 2$$

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

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

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

Vertex (0, 2)

$$41) g(x) = x^2 + 8x + 11$$

$$x^2 + 8x + (4)^2 + 11 - (4)^2$$

$$(x+4)^2 - 5$$

$$\text{vertex} = (-4, -5)$$

$$x = -4$$

$$43) g(x) = -x^2 + 4x + 2$$

$$= -1(x^2 - 4x + (-2)^2) + 2 - (-1)(-2)^2$$

$$= -1(x-2)^2 + 6$$

Vertex (2, 6)

$$45) -3x^2 + 6x - 9$$

$$= -3(x^2 - 2x + (-1)^2) - 9 - (-3)(-1)^2$$

$$= -3(x-1)^2 - 6$$

Vertex (1, -6)

$$47) \quad 1) \quad (x-2)^2 + 5$$

$$2) \quad 3(x-2)^2 + 5$$

$$3) \quad 87(x-2)^2 + 5$$

$$5) p = h^2 - 12h + 210$$

$$= 1(h^2 - 12h + (-6)^2) + 210 - (1)(-6)^2$$

$$= 1(h-6)^2 + 174$$

a) 6AM

b) 174 Mega Watts

$$c) \begin{array}{r} h^2 - 12h + 210 = 187 \\ -210 \quad -210 \\ \hline \end{array}$$

$$\begin{array}{r} h^2 - 12h + (-6)^2 = -23 + (-6)^2 \\ \sqrt{(h-6)^2} = \sqrt{13} \end{array}$$

$$\begin{array}{r} h-6 = \pm \sqrt{13} \\ +6 \quad +6 \\ \hline h = \pm \sqrt{13} + 6 \end{array}$$

$$h = 10\text{AM}, 3\text{AM}$$