

## Mid-Unit 4 Test Review

Solve each equation by taking square roots.

$$1) \frac{4x^2}{4} = \frac{64}{4}$$

$$\sqrt{x^2} = \sqrt{16}$$

$$x = \pm 4$$

$$2) \sqrt{(x+5)^2} = \sqrt{16}$$

$$x+5 = \pm 4$$

$$-5 \quad -5$$

$$x = \pm 4 - 5$$

$$x = -9, -1$$

$$3) -2(x+3)^2 + 20 = -220$$

$$\quad \quad -20 \quad -20$$

$$\frac{-2(x+3)^2}{-2} = \frac{-240}{-2}$$

$$\sqrt{(x+3)^2} = \sqrt{120}$$

$$x+3 = 2\sqrt{30}$$

$$\quad -3 \quad -3$$

$$x = 2\sqrt{30} - 3$$

$$\sqrt{120} = \sqrt{4 \cdot 30}$$

$$= \sqrt{4} \cdot \sqrt{30}$$

$$= 2\sqrt{30}$$

$$4) \frac{(x+2)^2}{3} = -9 \cdot 3$$

$$\sqrt{(x+2)^2} = \sqrt{-27}$$

No Solution

$$5) \frac{(x-4)^2}{3} + 8 = 17$$

$$\quad \quad -8 \quad -8$$

$$3 \cdot \frac{(x-4)^2}{3} = 9 \cdot 3$$

$$\sqrt{(x-4)^2} = \sqrt{27}$$

$$x-4 = 3\sqrt{3}$$

$$\quad +4 \quad +4$$

$$x = 3\sqrt{3} + 4$$

$$\sqrt{27} = \sqrt{9 \cdot 3}$$

$$= \sqrt{9} \cdot \sqrt{3}$$

$$= 3\sqrt{3}$$

$$6) 2x^2 + 10 = 28$$

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

$$\frac{2x^2}{2} = \frac{18}{2}$$

$$\sqrt{x^2} = \sqrt{9}$$

$$x = \pm 3$$

$$7) 6k^2 + 10 = -156$$

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

$$\frac{6k^2}{6} = \frac{-166}{6}$$

$$\sqrt{k^2} = \sqrt{-\frac{83}{3}}$$

No Solution

$$8) 10n^2 - 19 = 3581$$

$$\quad \quad +19 \quad +19$$

$$\frac{10n^2}{10} = \frac{3600}{10}$$

$$\sqrt{n^2} = \sqrt{360}$$

$$n = 6\sqrt{10}$$

$$\sqrt{360} = \sqrt{36 \cdot 10}$$

$$= \sqrt{36} \cdot \sqrt{10}$$

$$= 6 \cdot \sqrt{10}$$

Solve each equation with the quadratic formula.

$$9) 2k^2 - 4k + 2 = 0 \quad X = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$a=2 \quad X = \frac{4 \pm \sqrt{16 - 16}}{4} = \frac{4 \pm \sqrt{0}}{4}$$

$$b=-4$$

$$c=2 \quad = \frac{4 \pm 0}{4} = 1$$

$$10) 2n^2 - 3n + 1 = 0$$

$$a=2 \quad X = \frac{3 \pm \sqrt{9 - 8}}{4} = \frac{3 \pm \sqrt{1}}{4}$$

$$b=-3$$

$$c=1 \quad = \frac{3 \pm 1}{4} = 1, \frac{1}{2}$$

11)  $4n^2 + 4n + 4 = 0$   
 $a=4$   
 $b=4$   
 $c=4$   

$$X = \frac{-4 \pm \sqrt{16 - 64}}{8} = \frac{-4 \pm \sqrt{-48}}{8}$$
No Solution

12)  $7b^2 - 10b - 1 = 0$   
 $a=7$   
 $b=-10$   
 $c=-1$   

$$X = \frac{10 \pm \sqrt{100 + 28}}{14} = \frac{10 \pm \sqrt{128}}{14}$$

$$= \frac{10 \pm 8\sqrt{2}}{14} = \frac{5 \pm 4\sqrt{2}}{7}$$
 $\frac{5 \pm 4\sqrt{2}}{7}$

13)  $5x^2 - 12 = 0$   
 $a=5$   
 $b=-12$   
 $c=0$   

$$X = \frac{12 \pm \sqrt{144 - 0}}{10}$$

$$X = \frac{12 \pm 12}{10} = \frac{0}{10}, \frac{24}{10}$$
 $0, \frac{12}{5}$

14)  $2n^2 - n - 71 = 7$   
 $-7 -7$   
 $2n^2 - n - 78 = 0$   
 $a=2$   
 $b=-1$   
 $c=-78$   

$$X = \frac{1 \pm \sqrt{1 + 2496}}{2} = \frac{1 \pm \sqrt{2497}}{2}$$
 $\frac{1 \pm \sqrt{2497}}{2}$

Solve each equation by completing the square.

15)  $p^2 + 14p + 45 = 0$   $(\frac{b}{2})^2 = (\frac{14}{2})^2 = 7^2 = 49$   
 $(p^2 + 14p + 49) - 49 + 45 = 0$   
 $(p+7)^2 - 4 = 0$   
 $\begin{matrix} +4 & +4 \\ \sqrt{(p+7)^2} = \sqrt{4} \end{matrix}$   
 $\begin{matrix} p+7 = \pm 2 \\ -7 & -7 \end{matrix}$   
 $p = \pm 2 - 7$   
 $p = -5, -9$

16)  $a^2 + 4a - 21 = 0$   $(\frac{b}{2})^2 = (\frac{4}{2})^2 = 4$   
 $(a^2 + 4a + 4) - 4 - 21 = 0$   
 $(a+2)^2 - 25 = 0$   
 $\begin{matrix} +25 & +25 \\ \sqrt{(a+2)^2} = \sqrt{25} \end{matrix}$   
 $\begin{matrix} a+2 = \pm 5 \\ -2 & -2 \end{matrix}$   
 $a = \pm 5 - 2$   
 $a = -7, 3$

17)  $n^2 - 10n - 72 = 0$   $(\frac{b}{2})^2 = 25$   
 $(n^2 - 10n + 25) - 25 - 72 = 0$   
 $(n-5)^2 - 97 = 0$   
 $\begin{matrix} +97 & +97 \\ \sqrt{(n-5)^2} = \sqrt{97} \end{matrix}$   
 $\begin{matrix} n-5 = \sqrt{97} \\ +5 & +5 \end{matrix}$   
 $n = \sqrt{97} + 5$

18)  $5x^2 - 10x + 42 = 0$   $(\frac{-2}{2})^2 = 1$   
 $x^2 - 2x + \frac{42}{5} = 0$   
 $(x^2 - 2x + 1) - \frac{5}{5} + \frac{42}{5} = 0$   
 $(x-1)^2 + \frac{37}{5} = 0$   
 $\begin{matrix} -\frac{37}{5} & -\frac{37}{5} \\ \sqrt{(x-1)^2} = \sqrt{-37/5} \end{matrix}$   
No Solution

19)  $9r^2 + 18r - 11 = 0$   $(\frac{2}{2})^2 = 1$   
 $r^2 + 2r - \frac{11}{9} = 0$   
 $(r^2 + 2r + 1) - \frac{9}{9} - \frac{11}{9} = 0$   
 $(r+1)^2 - \frac{20}{9} = 0$   
 $\begin{matrix} +\frac{20}{9} & +\frac{20}{9} \\ \sqrt{(r+1)^2} = \sqrt{20/9} \end{matrix}$   
 $\begin{matrix} r+1 = \frac{2\sqrt{5}}{3} \\ -1 & -1 \end{matrix}$   
 $r = \frac{2\sqrt{5}}{3} - 1$

20)  $a^2 + 16a + 19 = -9$   $(\frac{16}{2})^2 = 64$   
 $\begin{matrix} +9 & +9 \\ a^2 + 16a + 28 = 0 \end{matrix}$   
 $(a^2 + 16a + 64) - 64 + 28 = 0$   
 $(a+8)^2 - 36 = 0$   
 $\begin{matrix} +36 & +36 \\ \sqrt{(a+8)^2} = \sqrt{36} \end{matrix}$   
 $\begin{matrix} a+8 = \pm 6 \\ -8 & -8 \end{matrix}$   
 $a = \pm 6 - 8$   
 $a = -2, -14$