

## UNIT 14 REVIEW ANSWER KEY

### Square Root

$$\begin{aligned} \text{a) } \frac{3x^2}{3} &= \frac{27}{3} \\ x^2 &= 9 \\ \sqrt{x^2} &= \pm \sqrt{9} \\ x &= \pm 3 \\ x &= \{3, -3\} \end{aligned}$$

### Factor

$$\begin{aligned} \text{b) } 2x^2 - 12x &= -16 \\ 2x^2 - 12x + 16 &= 0 \\ 2(x^2 - 6x + 8) &= 0 \\ 2(x-4)(x-2) &= 0 \\ x-4 = 0 \quad x-2 = 0 \\ x = 4 \quad x = 2 \\ x &= \{4, 2\} \end{aligned}$$

### Factor

$$\begin{aligned} \text{c) } x^2 - 5x &= 0 \\ x(x-5) &= 0 \\ x = 0 \quad x-5 = 0 \\ x = 0 \quad x = 5 \\ x &= \{0, 5\} \end{aligned}$$

### Square Root

$$\begin{aligned} \text{d) } \frac{8(x-4)^2}{8} &= \frac{200}{8} \\ (x-4)^2 &= 25 \\ \sqrt{(x-4)^2} &= \pm \sqrt{25} \\ x-4 &= \pm 5 \\ x-4 = 5 \quad x-4 = -5 \\ x = 9 \quad x = -1 \\ x &= \{9, -1\} \end{aligned}$$

### Factor

$$\begin{aligned} \text{e) } x(x+3) &= 40 \\ x^2 + 3x &= 40 \\ x^2 + 3x - 40 &= 0 \\ (x+8)(x-5) &= 0 \\ x+8 = 0 \quad x-5 = 0 \\ x = -8 \quad x = 5 \\ x &= \{-8, 5\} \end{aligned}$$

### Factor

$$\begin{aligned} \text{f) } \frac{x}{5} &= \frac{3}{x+2} \\ x(x+2) &= (3)(5) \\ x^2 + 2x &= 15 \\ x^2 + 2x - 15 &= 0 \\ (x+5)(x-3) &= 0 \\ x+5 = 0 \quad x-3 = 0 \\ x = -5 \quad x = 3 \\ x &= \{-5, 3\} \end{aligned}$$

- 2)  $x$ : 1<sup>st</sup> *negative* consecutive integer **(-7)**  
 $x+1$ : 2<sup>nd</sup> *negative* consecutive integer **(-6)**

$$\begin{aligned} x^2 + 2(x+1) &= 37 \\ x^2 + 2x + 2 &= 37 \\ x^2 + 2x - 35 &= 0 \\ (x+7)(x-5) &= 0 \\ x+7 = 0 \quad x-5 = 0 \\ x = -7 \quad x = \cancel{5} \end{aligned}$$

Reject 5 because it's a positive integer

- 3)  $x$ : width **(4 inches)**  
 $2x+4$ : length **(12 inches)**

$$\begin{aligned} x(2x+4) &= 48 \\ 2x^2 + 4x &= 48 \\ 2x^2 + 4x - 48 &= 0 \\ 2(x^2 + 2x - 24) &= 0 \\ 2(x+6)(x-4) &= 0 \\ x+6 = 0 \quad x-4 = 0 \\ x = \cancel{-6} \quad x = 4 \end{aligned}$$

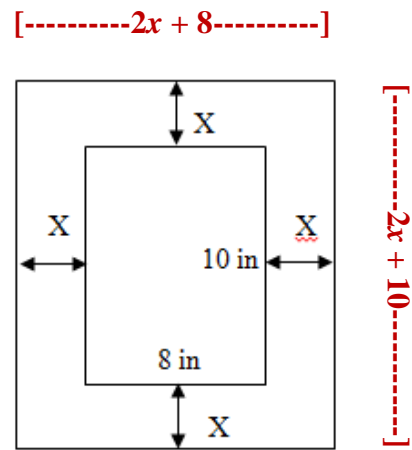
Reject -6 because a width cannot be a negative number

4)  $x$ : width of the frame

$$\begin{aligned}
 (2x + 8)(2x + 10) &= 120 \\
 4x^2 + 20x + 16x + 80 &= 120 \\
 4x^2 + 36x + 80 &= 120 \\
 4x^2 + 36x - 40 &= 0 \\
 4(x^2 + 9x - 10) &= 0 \\
 4(x + 10)(x - 1) &= 0 \\
 x + 10 = 0 &\quad x - 1 = 0 \\
 x = -10 &\quad x = 1
 \end{aligned}$$

Reject -10 because the width of a frame cannot be a negative number

**The width of the frame is 1 inch**



5)  $2x^2 - 6x + 3 = 0$        $a = 2, b = -6, c = 3$

$$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(2)(3)}}{2(2)}$$

$$x = \frac{6 \pm \sqrt{12}}{4} \rightarrow \sqrt{12} = \sqrt{4} \cdot \sqrt{3} = 2\sqrt{3}$$

$$x = \frac{6 \pm 2\sqrt{3}}{4}$$

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

$$x = \frac{3 + \sqrt{3}}{2} \quad x = \frac{3 - \sqrt{3}}{2}$$

6)  $x^2 + 6x - 6 = 0$

$$x^2 + 6x = 6$$

$$x^2 + 6x + \frac{(6/2)^2}{3^2} = 6 + \frac{(6/2)^2}{3^2}$$

$$x^2 + 6x + 9 = 6 + 9$$

$$(x + 3)^2 = 15$$

$$\sqrt{(x + 3)^2} = \pm \sqrt{15}$$

$$x + 3 = \pm \sqrt{15}$$

$$x = -3 \pm \sqrt{15}$$

$$x = \{-3 - \sqrt{15}, -3 + \sqrt{15}\}$$