Unit 7/9 – Quadratic Equations

Factor:
- (2) – GCF method
- (2) – Difference of 2 Squares
- (3) – $a = 1$
- (3) – $a \neq 1$

C **1.** Factor: $5x^2 + 15x$ (2) terms – GCF method

(A) $5x(x+15)$ (B) $5(x^2 + 3x)$

(C) $5x(x+3)$ ✓   (D) $5x(x + 15x)$

GCF:

$$5x' \,\boxed{\begin{array}{c|c} 5x^2 & 15x \end{array}} \quad \xrightarrow{\quad} \quad \underline{1x + 3}$$

$$5x^2 \qquad 15x$$
$$\wedge \qquad\quad \wedge$$
$$1 \cdot 5 \cdot x \cdot x \quad 3 \cdot 5 \cdot x$$

$$GCF = 5 \cdot x = 5x$$

A **2.** What are the zeros of the following factors: $(x-11)(x-5) = 0$?

(A) $x = 11$ and 5 ✓   (B) $x = -11$ and -5

(C) $x = -11$ and 5 (D) $x = 11$ and -5

$$\begin{array}{cc} x - 11 = 0 & x - 5 = 0 \\ +11 \; +11 & +5 \; +5 \\ \hline x = 11 & x = 5 \end{array}$$

B **3.** Factor to find the solutions (zeros) of the quadratic equation: $x^2 + 5x = -6$? $\rightarrow a = 1$; X-method

(A) $x = -2$ and 3 (B) $x = -3$ and -2 ✓

(C) $x = 2$ and 3 (D) $x = -3$ and 2

$$x^2 + 5x = -6$$
$$\qquad\quad +6 \quad\; +6$$
$$x^2 + 5x + 6 = 0$$
$$a = 1 \quad b = 5 \quad c = 6$$

X-method:
$$\begin{array}{c} 6 \;(x) \\ a \cdot c \\ +2 \diagdown\diagup +3 \\ 5 \;(+) \end{array}$$

$$\begin{array}{c|c} 6 & 5 \\ \hline 1 + 6 \neq 7 \\ 2 + 3 = 5 \end{array}$$

$(x+2)(x+3) = 0$

$$\begin{array}{cc} x + 2 = 0 & x + 3 = 0 \\ -2 \; -2 & -3 \; -3 \\ \hline x = -2 & x = -3 \end{array}$$

C **4.** Solve by factoring: $2x^2 - x - 15 = 0$ (zeros) 3 terms $\rightarrow a \neq 1$; X-method + box method

$a = 2 \quad b = -1 \quad c = -15$

(A) $x = -3$ or $x = \frac{5}{2}$ (B) $x = 3$ or $x = \frac{5}{2}$

(C) $x = 3$ or $x = -\frac{5}{2}$ ✓   (D) $x = -3$ or $x = -\frac{5}{2}$

$$\begin{array}{c} -30 \;(x) \\ a \cdot c \\ +5 \diagdown\diagup -6 \\ -1 \;(+) \end{array}$$

$$\begin{array}{c|c} 30 & -1 \\ \hline 1 + -30 \neq -29 \\ 5 + -6 = -1 \end{array}$$

$$\begin{array}{c|c|c} & 2x & -3 \\ \hline 2x & 2x^2 & -6x \\ \hline +5 & 5x & -15 \end{array}$$

$\rightarrow -x$

$$\begin{array}{cc} 2x + 5 = 0 & x - 3 = 0 \\ -5 \; -5 & +3 \; +3 \\ \hline 2x = -5 & x = 3 \\ \frac{2x}{2} = \frac{-5}{2} \\ x = -\frac{5}{2} \end{array}$$

B **5.** Find the GCF of the following expression: $10x^3 - 5x^2$

(A) $2x$ (B) $5x^2$ ✓

(C) $5x$ (D) $2x^2$

GCF:

$$5x^2 \,\boxed{\begin{array}{c|c} 10x^3 & -5x^2 \end{array}}$$

$$10x^3 \qquad\qquad -5x^2$$
$$\wedge \qquad\qquad\qquad \wedge$$
$$2 \cdot 5 \cdot x \cdot x \cdot x \quad -1 \cdot 5 \cdot x \cdot x$$

$$GCF = 5 \cdot x \cdot x = 5x^2$$