

SOLUTIONS => CHAPTER 7 & 8 REVIEWMULTIPLE CHOICE

$$\begin{aligned}
 1. & \quad 6|(5 - (-8))| \\
 & = 6|5 + 8| \\
 & = 6|13| \\
 & = 6(13) \\
 & = 78
 \end{aligned}$$

A

$$\begin{aligned}
 2. & \quad |-9 + 1^2| - |7 - (-5)| + |6 - 9| + |1| \\
 & = |-9 + 1| - |7 + 5| + |-3| + |1| \\
 & = |-8| - |12| + 3 + 1 \\
 & = 8 - 12 + 4 \\
 & = -4 + 4 \\
 & = 0
 \end{aligned}$$

B

$$\begin{aligned}
 3. & \quad y = |-2x + 4| \quad \text{line has } \circ \\
 & \quad y = mx + b \quad m = -2 \quad b = 4
 \end{aligned}$$

\* Needs to be reflected B

$$4. \quad y = |-5x + 2| \quad (\text{Linear})$$

$$\text{Domain: } \{x | x \in \mathbb{R}\}$$

$$\text{Range: } \{y | y \geq 0, y \in \mathbb{R}\}$$

C

$$5. \quad y = |-8x^2 + 6x + 3| \quad (\text{Quadratic})$$

$$\text{Domain: } \{x | x \in \mathbb{R}\}$$

$$\text{Range: } \{y | y \geq 0, y \in \mathbb{R}\}$$

A

$$6. y = |(x+2)^2 - 2|$$

Vertex:  $(-2, -2)$   
(before reflection)

Vertex:  $(-2, 2)$   
(after reflection) **B**

$$7. |x+5|=6 \quad x+5=0 \quad |x+5| = \begin{cases} x+5, & x \geq -5 \\ -(x+5), & x < -5 \end{cases}$$

Case 1

Case 2

$$\begin{aligned} x+5 &= 6 \\ x &= 6-5 \\ x &= 1 \checkmark \end{aligned}$$

$$\begin{aligned} -(x+5) &= 6 \\ x+5 &= -6 \\ x &= -6-5 \\ x &= -11 \checkmark \end{aligned}$$

**B**

$$8. |2x+7|-2=7 \quad 2x+7=0 \quad |2x+7| = \begin{cases} 2x+7, & x \geq -7/2 \\ -(2x+7), & x < -7/2 \end{cases}$$

$$\begin{aligned} |2x+7| &= 7+2 \\ |2x+7| &= 9 \end{aligned}$$

$$\begin{aligned} 2x+7 &= 0 \\ \frac{2x}{2} &= \frac{-7}{2} \\ x &= \frac{-7}{2} \end{aligned}$$

Case 1

Case 2

$$\begin{aligned} 2x+7 &= 9 \\ 2x &= 9-7 \\ \frac{2x}{2} &= \frac{2}{2} \\ x &= 1 \checkmark \end{aligned}$$

$$\begin{aligned} -(2x+7) &= 9 \\ 2x+7 &= -9 \\ 2x &= -9-7 \\ \frac{2x}{2} &= \frac{-16}{2} \\ x &= -8 \checkmark \end{aligned}$$

**B**

$$9. \textcircled{1} y = -x + 3$$

$$\textcircled{2} y = x^2 + 3x + 7$$

Substitution:

$$-x + 3 = x^2 + 3x + 7$$

$$0 = x^2 + 3x + x + 7 - 3$$

$$0 = x^2 + 4x + 4$$

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

$$x + 2 = 0$$

$$x = -2 \text{ sub in } \textcircled{1}$$

$$\textcircled{1} y = -x + 3$$

$$y = -(-2) + 3$$

$$y = 2 + 3$$

$$y = 5$$

$$* (-2, 5) \quad D$$

$$10. \textcircled{1} y = 6x$$

$$\textcircled{2} y = 3x^2$$

Substitution:

$$6x = 3x^2$$

$$0 = 3x^2 - 6x$$

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

$$\frac{3x}{3} = \frac{0}{3} \quad x - 2 = 0$$

$$x = 0 \quad x = 2$$

$$\text{sub in } \textcircled{1}$$

$$\textcircled{1} \begin{array}{l} x = 0 \\ y = 6x \\ y = 6(0) \\ y = 0 \end{array} \quad \left\{ \begin{array}{l} x = 2 \\ y = 6x \\ y = 6(2) \\ y = 12 \end{array} \right.$$

$$* (0, 0) \quad * (2, 12) \quad A$$

$$11. \begin{array}{l} \textcircled{1} y = 6x + 2 \\ \textcircled{2} y = x^2 - 2x + 17 \end{array}$$

Substitution:

$$\begin{aligned} 6x + 2 &= x^2 - 2x + 17 \\ 0 &= x^2 - 2x - 6x + 17 - 2 \\ 0 &= x^2 - 8x + 15 \\ 0 &= (x - 5)(x - 3) \\ x - 5 &= 0 & x - 3 &= 0 \\ x &= 5 & x &= 3 \end{aligned}$$

sub in  $\textcircled{1}$

$$\begin{array}{l} x = 5 \\ \textcircled{1} y = 6x + 2 \\ y = 6(5) + 2 \\ y = 30 + 2 \\ y = 32 \\ * (5, 32) \end{array} \quad \left. \begin{array}{l} x = 3 \\ y = 6x + 2 \\ y = 6(3) + 2 \\ y = 18 + 2 \\ y = 20 \\ * (3, 20) \end{array} \right\} A$$

$$12. \begin{array}{l} \textcircled{1} y = -4x^2 + 6x + 4 \\ \textcircled{2} y = 4x^2 + 6x - 4 \end{array}$$

Substitution:

$$\begin{aligned} -4x^2 + 6x + 4 &= 4x^2 + 6x - 4 \\ -4x^2 - 4x^2 + 6x - 6x + 4 + 4 &= 0 \\ -8x^2 + 8 &= 0 \\ -8(x^2 - 1) &= 0 \\ -8(x - 1)(x + 1) &= 0 \\ x - 1 &= 0 & x + 1 &= 0 \\ x &= 1 & x &= -1 \end{aligned}$$

sub in  $\textcircled{2}$

$$\begin{array}{l} x = 1 \\ \textcircled{2} y = 4x^2 + 6x - 4 \\ y = 4(1)^2 + 6(1) - 4 \\ y = 4(1) + 6 - 4 \\ y = 4 + 6 - 4 \\ y = 6 \\ * (1, 6) \end{array} \quad \left. \begin{array}{l} x = -1 \\ y = 4x^2 + 6x - 4 \\ y = 4(-1)^2 + 6(-1) - 4 \\ y = 4(-1) - 6 - 4 \\ y = 4 - 6 - 4 \\ y = -6 \\ * (-1, -6) \end{array} \right\} D$$

$$13. y = -1.4x^2 - 2x + 5 \text{ (Parabola / Opens Downward / } y\text{-int} = 5)$$

$$y = 1.1x - 4.8 \text{ (Line / Slope} = \frac{1.1}{1} \text{ / } y\text{-int} = 4.8)$$

D

SHORT ANSWER

$$1. |2x+8| + 6 = -3$$

$$|2x+8| = -3-6$$

$$|2x+8| = -9 \leftarrow \text{NO SOLUTION.}$$

$$2. |x^2 - 8x - 20| = 7x - 4$$

$$x^2 - 8x - 20 = 0$$

$$(x-10)(x+2) = 0$$

$$x-10 = 0 \quad x+2 = 0$$

$$x = 10 \quad x = -2$$

$$x^2 - 8x - 20 = \begin{cases} x^2 - 8x - 20, & x \leq -2 \text{ or } x \geq 10 \\ -(x^2 - 8x - 20) - 2, & -2 < x < 10 \end{cases}$$

Case 1

$$x^2 - 8x - 20 = 7x - 4$$

$$x^2 - 8x - 7x - 20 + 4 = 0$$

$$x^2 - 15x - 16 = 0$$

$$(x+1)(x-16) = 0$$

$$x+1 = 0 \text{ or } x-16 = 0$$

$$x = -1 \text{ or } x = 16$$

↑  
Extraneous

Case 2

$$-(x^2 - 8x - 20) = 7x - 4$$

$$x^2 - 8x - 20 = -7x + 4$$

$$x^2 - 8x + 7x - 20 - 4 = 0$$

$$x^2 - 1x - 24 = 0$$

$$a=1, b=-1, c=-24$$

$$x = \frac{1 \pm \sqrt{(-1)^2 - 4(1)(-24)}}{2(1)}$$

$$x = \frac{1 \pm \sqrt{1+96}}{2}$$

$$x = \frac{1 \pm \sqrt{97}}{2} \quad \begin{cases} x = 5.42 \checkmark \\ \text{or} \\ x = -4.42 \times \\ \text{Extraneous} \end{cases}$$



$$3. \begin{array}{l} \textcircled{1} y = -4x + 5 \\ \textcircled{2} y = 4x^2 + 2x + 7 \end{array}$$

Substitution:

$$-4x + 5 = 4x^2 + 2x + 7$$

$$0 = 4x^2 + 2x + 4x + 7 - 5$$

$$0 = 4x^2 + 6x + 2$$

$$0 = \left(x + \frac{4}{4}\right)\left(x + \frac{2}{4}\right)$$

$$0 = (x+1)\left(x + \frac{1}{2}\right)$$

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

$$x+1=0 \quad 2x+1=0$$

$$x=-1 \quad 2x=-1$$

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

sub in  $\textcircled{1}$ 

$$\begin{array}{l} x = -1 \quad x = -\frac{1}{2} \\ \textcircled{1} y = -4x + 5 \quad y = -4x + 5 \\ y = -4(-1) + 5 \quad y = -4\left(-\frac{1}{2}\right) + 5 \\ y = 4 + 5 \quad y = 2 + 5 \\ y = 9 \quad y = 7 \end{array}$$

\* (-1, 9)

\* (-1/2, 7)

$$4. \begin{array}{l} \textcircled{1} y = 6x - 2 \\ \textcircled{2} y = 2x^2 + 2x - 18 \end{array}$$

Substitution:

$$6x - 2 = 2x^2 + 2x - 18$$

$$0 = 2x^2 + 2x - 6x - 18 + 2$$

$$0 = 2x^2 - 4x - 16$$

$$0 = 2(x^2 - 2x - 8)$$

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

$$x+2=0 \quad x-4=0$$

$$x = -2 \quad x = 4$$

sub in  $\textcircled{1}$ 

$$\begin{array}{l} x = -2 \quad x = 4 \\ \textcircled{1} y = 6x - 2 \quad y = 6x - 2 \\ y = 6(-2) - 2 \quad y = 6(4) - 2 \\ y = -12 - 2 \quad y = 24 - 2 \\ y = -14 \quad y = 22 \end{array}$$

\* (-2, -14)

\* (4, 22)

$$5. \begin{array}{l} \textcircled{1} y = -5x^2 + 7x - 2 \\ \textcircled{2} y = 5x^2 - 3x - 2 \end{array}$$

Substitution:

$$\begin{aligned} -5x^2 + 7x - 2 &= 5x^2 - 3x - 2 \\ -5x^2 - 5x^2 + 7x + 3x - 2 + 2 &= 0 \\ -10x^2 + 10x &= 0 \\ -10x(x-1) &= 0 \\ \cancel{-10}x = 0 & \quad x-1 = 0 \\ \cancel{-10} \quad \cancel{-10} & \quad x = 1 \\ x = 0 & \end{aligned}$$

$$\begin{array}{l} x=0 \\ \textcircled{2} y = 5x^2 - 3x - 2 \\ y = 5(0)^2 - 3(0) - 2 \\ y = 0 - 0 - 2 \\ y = -2 \end{array} \left\{ \begin{array}{l} x=1 \\ y = 5x^2 - 3x - 2 \\ y = 5(1)^2 - 3(1) - 2 \\ y = 5(1) - 3 - 2 \\ y = 5 - 5 \\ y = 0 \end{array} \right.$$

$$* (0, -2) \quad * (1, 0)$$

Sub in  $\textcircled{2}$