SOLUTIONS => CHAPTER 7 & 8 REVIEW

MULTIPLE CHOICE

1. $6|(5-(-8))|$
$= 6|5+8|$
$= 6|13|$
$= 6(13)$
$= 78$ A

2. $|-9+1^2| - |7-(-5)| + |6-9| + |1|$
$= |-9+1| - |7+5| + |-3| + 1$
$= |-8| - |12| + 3 + 1$
$= 8 - 12 + 4$
$= -4 + 4$
$= 0$ B

3. $y = |-2x+4|$ Line has :
$y = mx+b$ $m=-2,$ $b=4$

     * Needs to be reflected B

4. $y = |-5x+2|$ (Linear)

Domain: $\{x | x \in R\}$
Range: $\{y | y \geq 0, y \in R\}$ C

5. $y = |-8x^2+6x+3|$ (Quadratic)

Domain: $\{x | x \in R\}$
Range: $\{y | y \geq 0, y \in R\}$ A

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

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

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

Case 1   Case 2

$x + 5 = 6$ $-(x+5) = 6$
    $x = 6 - 5$ $x + 5 = -6$
    $x = 1$ ✓ $x = -6 - 5$ **B**
                  $x = -11$ ✓

8. $|2x+7| - 2 = 7$ $2x+7 = 0$ $|2x+7| = \begin{cases} 2x+7, & x \geq -7/2 \\ -(2x+7), & x < -7/2 \end{cases}$
$|2x+7| = 7 + 2$ $\dfrac{2x}{2} = \dfrac{-7}{2}$
$|2x+7| = 9$ $x = \dfrac{-7}{2}$

Case 1   Case 2

$2x + 7 = 9$ $-(2x+7) = 9$
   $2x = 9 - 7$ $2x + 7 = -9$
   $\dfrac{2x}{2} = \dfrac{2}{2}$ $2x = -9 - 7$
    $x = 1$ ✓ $\dfrac{2x}{2} = \dfrac{-16}{2}$ **B**
                  $x = -8$ ✓

9. ① $y = -x + 3$
   ② $y = x^2 + 3x + 7$

   Substitution:

   $-x + 3 = x^2 + 3x + 7$ ① $y = -x + 3$
   $\quad 0 = x^2 + 3x + x + 7 - 3$ $\quad y = -(-2) + 3$
   $\quad 0 = x^2 + 4x + 4$ $\quad y = 2 + 3$
   $\quad 0 = (x + 2)(x + 2)$ $\quad y = 5$
   $\quad\quad x + 2 = 0$
   $\quad\quad\quad x = -2$ sub in ① $*$ $(-2, 5)$ D

10. ① $y = 6x$
    ② $y = 3x^2$

    Substitution:

    $6x = 3x^2$ $x = 0$ $x = 2$
    $0 = 3x^2 - 6x$ ① $y = 6x$ $\begin{cases} y = 6x \end{cases}$
    $0 = 3x(x - 2)$ $\quad y = 6(0)$ $y = 6(2$
    $\dfrac{3x}{3} = \dfrac{0}{3}$ $x - 2 = 0$ $\quad y = 0$ $y = 12$
    $\quad\quad x = 2$
    $\quad x = 0$ sub in ① $*$ $(0, 0)$ $*$ $(2, 12$

    $\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad$ A

11. ① $y = 6x + 2$
② $y = x^2 - 2x + 17$

Substitution:

$6x + 2 = x^2 - 2x + 17$
$0 = x^2 - 2x - 6x + 17 - 2$
$0 = x^2 - 8x + 15$
$0 = (x-5)(x-3)$
$x - 5 = 0 \quad x - 3 = 0$
$x = 5 \quad\quad x = 3$
sub in ①

$x = 5$
① $y = 6x + 2$
$y = 6(5) + 2$
$y = 30 + 2$
$y = 32$
* $(5, 32)$

$x = 3$
$y = 6x + 2$
$y = 6(3) + 2$
$y = 18 + 2$
$y = 20$
* $(3, 20)$

A

12. ① $y = -4x^2 + 6x + 4$
② $y = 4x^2 + 6x - 4$

Substitution:

$-4x^2 + 6x + 4 = 4x^2 + 6x - 4$
$-4x^2 - 4x^2 + 6x - 6x + 4 + 4 = 0$
$-8x^2 + 8 = 0$
$-8(x^2 - 1) = 0$
$-8(x-1)(x+1) = 0$
$x - 1 = 0 \quad x + 1 = 0$
$x = 1 \quad\quad x = -1$ sub in ②

$x = 1$
② $y = 4x^2 + 6x - 4$
$y = 4(1)^2 + 6(1) - 4$
$y = 4(1) + 6 - 4$
$y = 4 + 6 - 4$
$y = 6$
* $(1, 6)$

$x = -1$
$y = 4x^2 + 6x - 4$
$y = 4(-1)^2 + 6(-1) - 4$
$y = 4(1) - 6 - 4$
$y = 4 - 6 - 4$
$y = -6$
* $(-1, -6)$

D

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

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

D

SHORT ANSWER

1. $|2x+8| + 6 = -3$
$|2x+8| = -3-6$
$|2x+8| = -9$ ← NO SOLUTION.

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

$x^2 - 8x - 20 = 0$ 　　　$x^2-8x-20 = \begin{cases} x^2-8x-20, & x \le -2 \text{ or } x \ge 10 \\ -(x^2-8x-20), & -2 < x < 10 \end{cases}$
$(x-10)(x+2) = 0$
$x-10 = 0 \quad x+2 = 0$
　　$x = 10 \quad\quad x = -2$

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

$-(x^2 - 8x - 20) = 7x - 4$
$x^2 - 8x - 20 = -7x + 4$
$x^2 - 8x + 7x - 20 - 4 = 0$
$x^2 - 1x - 24 = 0$
$a=1, b=-1, c=-24$
$x = \dfrac{1 \pm \sqrt{(-1)^2 - 4(1)(-24)}}{2(1)}$
$x = \dfrac{1 \pm \sqrt{1 + 96}}{2}$
$x = \dfrac{1 \pm \sqrt{97}}{2}$ → $x = 5.42$ ✓
　　　　　　　　　or
　　　　　　　$x = -4.42$ ✗
　　　　　　　Extraneous

3. ① $y = -4x+5$
② $y = 4x^2 + 2x + 7$

Substitution:
$-4x+5 = 4x^2 + 2x + 7$
$0 = 4x^2 + 2x + 4x + 7 - 5$
$0 = 4x^2 + 6x + 2$
$0 = (x + \frac{4}{4})(x + \frac{2}{4})$

$0 = (x+1)(x+\frac{1}{2})$
$0 = (x+1)(2x+1)$
$x+1 = 0 \qquad 2x+1 = 0$
$x = -1 \qquad 2x = -1$
$\qquad\qquad x = \frac{-1}{2}$
sub in ①

$x = -1 \qquad\qquad x = -\frac{1}{2}$
① $y = -4x+5 \qquad y = -4x+5$
$y = -4(-1)+5 \qquad y = -4(-\frac{1}{2})+5$
$y = 4+5 \qquad y = \frac{4}{2}+5$
$y = 9 \qquad y = 2+5$
$\qquad\qquad y = 7$

* $(-1, 9)$

* $(-\frac{1}{2}, 7)$

4. ① $y = 6x-2$
② $y = 2x^2 + 2x - 18$

Substitution:
$6x-2 = 2x^2 + 2x - 18$
$0 = 2x^2 + 2x - 6x - 18 + 2$
$0 = 2x^2 - 4x - 16$
$0 = 2(x^2 - 2x - 8)$
$0 = 2(x+2)(x-4)$
$\qquad x+2 = 0 \quad x-4 = 0$
$\qquad x = -2 \quad x = 4$
$\qquad$ sub in ①

$x = -2 \qquad\qquad x = 4$
① $y = 6x-2 \qquad y = 6x-2$
$y = 6(-2)-2 \qquad y = 6(4)-2$
$y = -12-2 \qquad y = 24-2$
$y = -14 \qquad y = 22$

* $(-2, -14)$ * $(4, 22)$

5. ① $y = -5x^2 + 7x - 2$
   ② $y = 5x^2 - 3x - 2$

Substitution:

$-5x^2 + 7x - 2 = 5x^2 - 3x - 2$

$-5x^2 - 5x^2 + 7x + 3x - 2 + 2 = 0$

$-10x^2 + 10x = 0$

$-10x(x - 1) = 0$

$-10x = 0 \qquad x - 1 = 0$

$\dfrac{-10x}{-10} = \dfrac{0}{-10} \qquad x = 1$

$x = 0$

Sub in ②

$x = 0$

② $y = 5x^2 - 3x - 2$

$y = 5(0)^2 - 3(0) - 2$

$y = 0 - 0 - 2$

$y = -2$

$*\ (0, -2)$

$x = 1$

$y = 5x^2 - 3x - 2$

$y = 5(1)^2 - 3(1) - 2$

$y = 5(1) - 3 - 2$

$y = 5 - 5$

$y = 0$

$*\ (1, 0)$