MATHEMATICS – REVISION FOR TERM 2 TEST

WORKED SOLUTIONS

① (a) $4\times5 - 2\sqrt{15} + 2\sqrt{15} - 9 = 20 - 3 = 17$

OR $(2\sqrt{5})^2 - (\sqrt{3})^2 = 20 - 3 = 17$

(b) $\dfrac{3\sqrt{3}}{2\sqrt{5}+\sqrt{3}} \times \dfrac{2\sqrt{5}-\sqrt{3}}{2\sqrt{5}-\sqrt{3}} = \dfrac{3\sqrt{3}(2\sqrt{5}-\sqrt{3})}{17}$

$= \dfrac{6\sqrt{15}-9}{17}$

(c) $7 + 2\sqrt{7} + 2\sqrt{7} + 4 = 11 + 4\sqrt{7}$

② (a) $3b - 22 = 8$

$3b = 30$

$b = 10$

(b) $\dfrac{a}{4} - \dfrac{a+2}{3} = 9$

$3a - 4(a+2) = 108$

$-a - 8 = 108$

$-a = 116$

$a = -116$

(c) $|2x+4| = |x-3|$

$x = -7$

(d) $4 - x > 7$

$-x > 3$

$x < -3$

(e) $3p + 1 \le p + 9$

$2p \le 8$

$p \le 4$

③ $x^2 - 6x + 1 = 0$

$x^2 - 6x = -1$

$x^2 - 6x + 9 = -1 + 9$

$(x-3)^2 = 8$

$x - 3 = \pm\sqrt{8} = \pm 2\sqrt{2}$

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

④ (a) $x - y = -7 \ldots ①$

$3x - 4y = -26 \ldots ②$

① × 3 $\quad 3x - 3y = -21 \ldots ③$

③ − ② $\quad y = 5$

subs in ① $\quad x - 5 = -7 \therefore x = -2$

$\therefore$ solution is $x = -2, y = 5$

(b) $xy = 4 \ldots ①$

$2x - 7 = y \ldots ②$

from ① $\quad y = 4/x \ldots ③$

subs ③ into ② $\quad 2x - 7 = \dfrac{4}{x}$

$2x^2 - 7x = 4$

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

$(2x+1)(x-4) = 0$

$x = -\frac{1}{2}, 4$

subs in ③ when $x = -1/2$, $y = 4/-1/2 = -8$

when $x = 4$, $y = 4/4 = 1$

⑤ (a) $3^{x+2} = 81$

$3^{x+2} = 3^4$

$\therefore x + 2 = 4$

$x = 2$

(b) $16^y = 2$

$(2^4)^y = 2^1$

$2^{4y} = 2^1$

$\therefore 4y = 1$

$y = 1/4$

⑥ (a) $|3b - 1| = 5$

$3b - 1 = 5$ or $3b - 1 = -5$

$3b = 6$ $\quad 3b = -4$

$b = 2$ $\quad b = -4/3$

(b) $|2x - 7| \ge 1$

$2x - 7 \ge 1$ or $2x - 7 \le -1$

$2x \ge 8$ $\quad 2x \le 6$

$x \ge 4$ $\quad x \le 3$

⑧ (a) $x^2 > 9 \quad \therefore x^2 - 9 > 0$

$(x+3)(x-3) > 0$

$\therefore x < -3$ or $x > 3$

(b) $x^2 - x - 6 \le 0 \therefore (x-3)(x+2) \le 0$

$-2 \le x \le 3$

⑦ $2x^2 - 3x + 1 = 0 \quad \therefore a = 2, b = -3, c = 1$

$x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \dfrac{3 \pm \sqrt{9 - 4\times2\times1}}{2\times2}$

$x = \dfrac{3 \pm 1}{4} = \frac{1}{2}, 1$

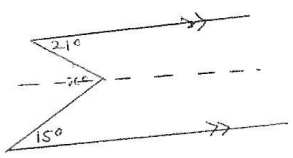
⑨ (a) $x = 43$ (vert opp ∠s)

$z - 10 = 137$ (straight ∠)

$\therefore z = 147$

$y = 137$ (vert. opp. ∠s)

(b)



$x = 21 + 15 = 36$ (alt ∠s and parallel lines)