

Test 2: Algebra

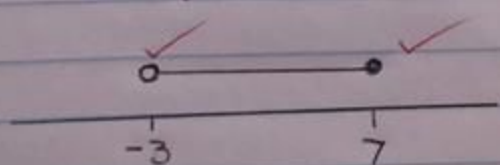
Question 1

$$\begin{aligned} 1.1) & (2x-1)^2 - (x-3)^2 \\ &= (2x-1)(2x-1) - (x-3)(x-3) \checkmark \\ &= 4x^2 - 4x + 1 - (x^2 - 6x + 9) \checkmark \\ &= 4x^2 - 4x + 1 - x^2 + 6x - 9 \checkmark \\ &= 3x^2 + 2x - 8 \checkmark \\ &= (3x - 4)(x + 2) \checkmark \end{aligned} \quad (6)$$

$$\begin{aligned} 1.2.1) & 2x^2 - x - 3 = 0 \\ & (2x-3)(x+1) = 0 \checkmark \\ & 2x-3=0 \quad \text{and} \quad x+1=0 \\ & 2x=3 \quad \quad \quad x=-1 \checkmark \\ & x=\frac{3}{2} \checkmark \end{aligned} \quad (3)$$

$$\begin{aligned} 1.2.2) & x(2x+3)=2 \\ & 2x^2+3x-2=0 \checkmark \\ & (2x-1)(x+2)=0 \checkmark \\ & 2x-1=0 \quad \text{and} \quad x+2=0 \\ & 2x=1 \quad \quad \quad x=-2 \checkmark \\ & x=\frac{1}{2} \checkmark \end{aligned} \quad (4)$$

$$\begin{aligned} 1.3) & -10 < 3x-1 \leq 20 \\ & -9 < 3x \leq 21 \checkmark \\ & -3 < x \leq 7 \checkmark \end{aligned}$$



$$x \in (-3; 7] \checkmark \quad (5)$$

$$1.4) \quad 3x - 2y + 8 = 0 \quad (2)$$

$$4y - 6 = 2x \quad (1)$$

$$\therefore x = 2y - 3 \quad (3)$$

$$3(2y - 3) - 2y + 8 = 0$$

$$6y - 9 - 2y + 8 = 0$$

$$4y = 1$$

$$y = \frac{1}{4}$$

$$x = 2\left(\frac{1}{4}\right) - 3$$

$$x = -\frac{5}{2}$$

(6)

Question 2

$$A = (x^2 - x + y - y^2) \quad ??$$

$(x - y)$

Area:

$$= x^2 - y^2 - x + y$$

$$= (x + y)(x - y) - 1(x + y)$$

$$= (x + y)(x - y - 1)$$

$$\therefore b = (x - y - 1)$$

$\therefore$ Perimeter:

$$= 2(x - y) + 2(x - y - 1)$$

$$= 2x - 2y + 2x - 2y - 2$$

$$= (4x - 4y - 2) \text{ m}$$

(8)

Question 3

$$3.1.1) \left(\frac{9x^2}{y^4} \right)^{-\frac{1}{2}} = \frac{9^{-\frac{1}{2}} x^{-1}}{y^{-2}}$$

$$= \frac{y^2}{(3^2)^{\frac{1}{2}} x} \checkmark$$

$$= \frac{y^2}{3x} \checkmark \checkmark$$

(3)

$$3.1.2) = \frac{2^{2x+2}}{8} \checkmark$$

$$= \frac{2^{2x} \cdot 2^2}{2^3} \checkmark$$

$$= \frac{2^{2x}}{2} \checkmark$$

(3)

$$3.1.3) = \frac{3^2 \times 2 \times 3 x^9 y^8}{2^2 \times 3 x y^6} \checkmark$$

$$= \frac{3^2 x^8 y^2}{2} \checkmark$$

$$= \frac{9 x^8 y^2}{2} \checkmark \checkmark$$

(4)

$$3.1.4) = \frac{x^6 y^{-4}}{z^{-4}} \div \frac{x^4 y^{-6}}{z^{-6}}$$

$$= \frac{x^6 z^4}{y^4} \div \frac{x^4 z^6}{y^6}$$

$$= \frac{x^6 z^4}{y^4} \times \frac{y^6}{x^4 z^6}$$

$$= \frac{x^2 y^2}{z^2}$$

(4)

$$3.2.1) 2^{2x-1} = 2^6 \checkmark$$

$$\therefore 2x-1 = 6 \checkmark$$

$$2x = 7$$

$$x = \frac{7}{2} \checkmark$$

(3)

$$3.2.2) (2^2)^x = (2^3)^{x-1}$$

$$2^{2x} = 2^{3x-3} \checkmark$$

$$\therefore 2x = 3x-3 \checkmark$$

$$-x = -3$$

$$x = 3 \checkmark$$

(3)

$$3.2.3) 5^{x-1} = \frac{4}{100}$$

$$5^{x-1} = \frac{1}{25}$$

$$5^{x-1} = 25^{-1} \checkmark$$

$$5^{x-1} = 5^{-2} \checkmark$$

$$x-1 = -2 \checkmark$$

$$x = -1 \checkmark$$

(4)