Math P2 Revision (2)

1a) $\left(\frac{x^2}{7y^3}\right)^2 \div \left(\frac{3y}{x}\right)^{-1}$

$= \left(\frac{x^4}{49y^6}\right) \div \left(\frac{x}{3y}\right)$

$= \frac{x^4}{49y^6} \times \frac{3y}{x} = \frac{3x^3}{49y^5}$

b) $\sqrt[4]{1296m^4n^{-8}} \times (m^{-5}n^3)^0 =$

$= (1296m^4n^{-8})^{\frac{1}{4}}$

$= 6mn^{-2}$

$= \frac{6m}{n^2}$

c) $2^{\frac{1}{3}} \times 12^{\frac{2}{3}} \times 3^{\frac{1}{3}}$

$= 6^{\frac{1}{3}} \times 12^{\frac{2}{3}}$

$= 6^{\frac{1}{3}} \times 2^{\frac{2}{3}} \times 6^{\frac{2}{3}}$

$= 6 \times 2^{\frac{2}{3}}$

$= 2 \times 3 \times 2^{\frac{2}{3}}$

$= 3(2^{\frac{5}{3}})$

2a) $\frac{2x+7}{x-5} + \frac{5(x-2)}{5-x} = -13$

$\frac{2x+7}{x-5} - \frac{5(x-2)}{x-5} = -13$

$\frac{2x+7-5x+10}{x-5} = -13$

$-3x+17 = -13(x-5)$

$-3x+17 = -13x+65$

$10x = 48$

$x = 4.8$

2b) $\frac{3}{x+1} + \frac{5}{x-3} = 3$

$\frac{3(x-3)+5(x+1)}{(x+1)(x-3)} = 3$

$3x - 9 + 5x + 5 = 3(x+1)(x-3)$

$8x - 4 = 3x^2 - 6x - 9$

$3x^2 - 14x - 5 = 0$

$+x$	-5	$-15x$
$+3x$	$+1$	$-x$
$+3x^2$	-5	$-14x$

$(x-5)(3x+1) = 0$

$x = 5$ or $x = -\frac{1}{3}$ "

3. (a) $\angle BDA = (180° - 52°) \div 2$ (base $\angle$s of a isos. $\triangle$)
$= 64°$

(b) $\angle OBA = \angle ODA$ (tan $\perp$ rad.)
$= 90°$

$\angle BOD = 360° - 90° - 90° - 52°$ ($\angle$ sum of quad.)
$= 128°$

(c) $\angle BDO = 90° - 64°$
$= 26°$

$\angle OEF = \angle BDO$ ($\angle$s in the same segment)
$= 26°$

(d) $\angle CDE = 180° - 45°$ (opp. $\angle$s in a cyclic quad.)
$= 135°$

$\angle BDE = 90°$ (rt. $\angle$ in a semicircle)

$\angle CDB = 135° - 90°$
$= 45°$

$\angle CDA = 24° - 45°$
$= 19°$ "

4a) $f = \sqrt{\frac{h}{x^2} + g^2}$

$f^2 = \frac{h}{x^2} + g^2$

$f^2 - g^2 = \frac{h}{x^2}$

$x^2 = \frac{h}{f^2 - g^2}$

$x = \sqrt{\frac{h}{(h-g)(h+g)}}$

or

$x = \sqrt{\frac{h}{f^2 - g^2}}$

b) $\frac{(2ab)^2}{35ab^7} \div \frac{16a^{-2}b^{-3}}{14a^3b^5}$

$= \frac{4a^2b^2}{35ab^7} \times \frac{14a^3b^5}{16a^{-2}b^{-3}}$

$= \frac{1}{10} \times \frac{a^5}{a^{-1}} \times \frac{b^7}{b^4}$

$= \frac{a^6b^3}{10}$

c) $\frac{2}{3}m - \frac{m-1}{4} < 7$

$\frac{2m(4) - 3(m-1)}{12} < 7$

$\frac{8m - 3m + 3}{12} < 7$

$5m + 3 < 84$

$5m < 81$

$m < 16\frac{1}{5}$

5 a) $\angle BGD = \angle FGA$ (vert. opp. $\angle$s)

$\angle GAF = \angle GDB$ (alt. $\angle$s, BD // AF)

$\angle GFA = \angle GBD$ (alt. $\angle$s, BD // AF)

$\therefore$ ΔBDG is similar to ΔFAG (AAA similarity)

b) Since ΔCBD is similar to ΔCAE,

$$\frac{BD}{AE} = \frac{x}{x+4}$$

$$\frac{3}{7} = \frac{x}{x+4}$$

$$3(x+4) = 7x$$

$$3x + 12 = 7x$$

$$x = 3 .$$

$\therefore$ Length of CB is 3 cm //

c) $$\frac{\text{Area of } \Delta BCD}{\text{Area of } \Delta ACE} = \left(\frac{3}{7}\right)^2$$

$$= \frac{9}{49}$$

$\therefore$ ratio = 9 : 49 //

d) $$\frac{\text{Area of } \Delta BCD}{\text{Area of } ABDE} = \frac{9}{40}$$

$\therefore$ ratio is 9 : 40 //.

e) ΔBCD and ΔABD share same height.

$$\frac{\text{Area of } \Delta BCD}{\text{Area of } \Delta ABD} = \frac{\frac{1}{2} \times BC \times h}{\frac{1}{2} \times AC \times h}$$

$$= \frac{3}{7} //$$

6a) Total area $= \left(\frac{1}{2} \times 12 \times 3\right) + \left(\frac{1}{2} \times 2 \times 5\right)$

$= 23 \text{ cm}^2$ //

b) shaded Area $= (x+15)(x+2) - 2(23)$

$= (x+15)(x+2) - 46$ //

c) $(x+15)(x+2) - 46 = 968$

$x^2 + 17x + 30 - 46 = 968$

$x^2 + 17x - 984 = 0$ (shown)

//

d) $x^2 + 17x - 984 = 0$

$(x + 41)(x - 24) = 0$

$x = -41$ or $x = 24$

(N.A.)

//

e) Perimeter

$= 2[(24+2) + (24+15)]$

$= 130 \text{ cm}$ //

7 a) $\angle PCD = \angle QCB$ (equilateral Δ)

$= 60°$

$\angle BCD = 90°$ (rt. $\angle$ in rectangle)

$\angle BCP = 90° - 60°$

$= 30°$

$\therefore \angle PCQ = 30° + 60°$ (shown)

$= 90°$

(b)

$\angle BCD = \angle PCQ = 90°$ (right angle)

$CD = CQ$

$CB = PC$

$\therefore \Delta BCD \equiv \Delta QCP$ (SAS)

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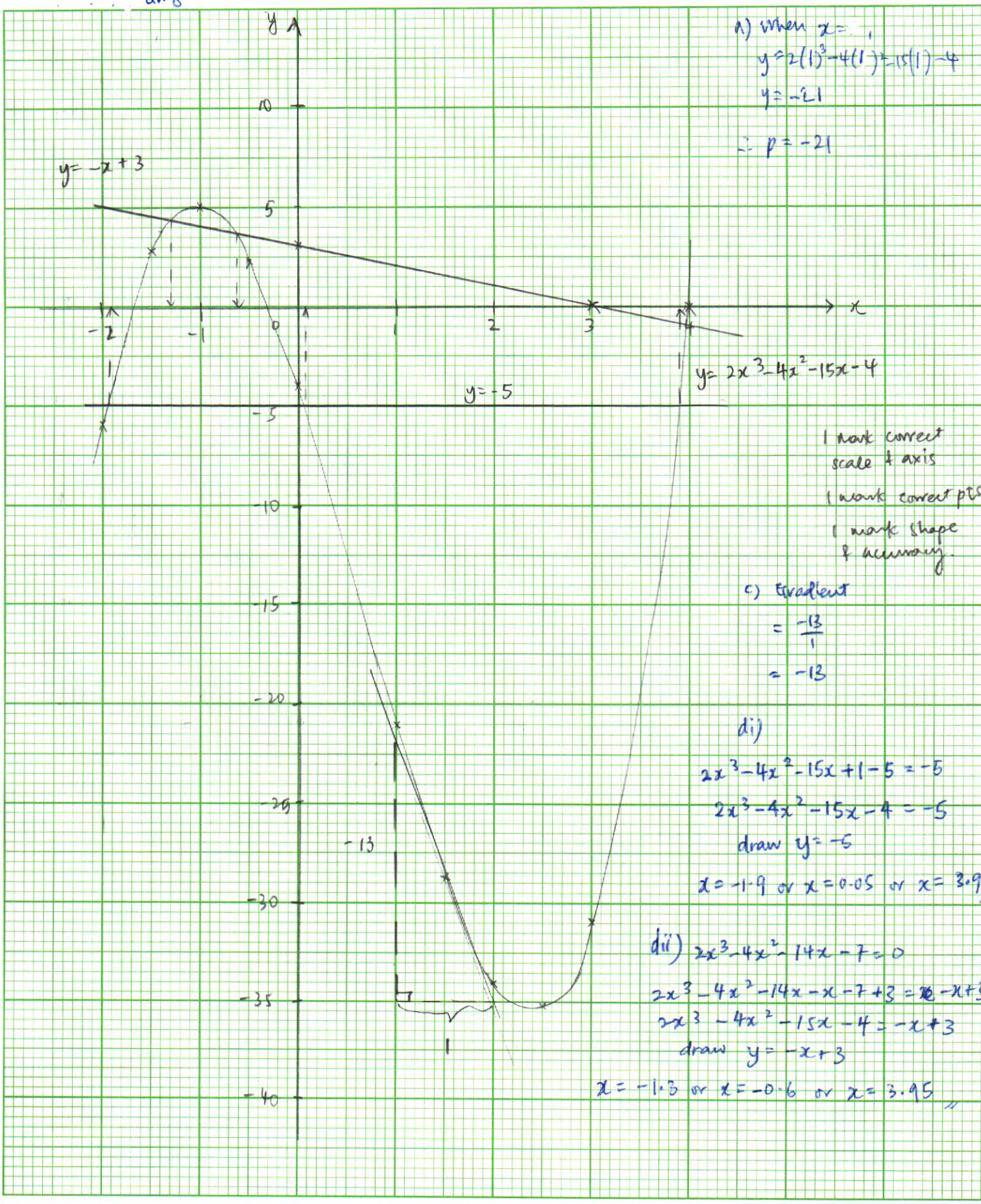
Qn 8



a) when $x = 1$,

$y = 2(1)^3 - 4(1)^2 - 15(1) - 4$

$y = -21$

$\therefore p = -21$

1 mark correct scale & axis

1 mark correct pts

1 mark shape & accuracy.

c) Gradient

$= \frac{-13}{1}$

$= -13$

dii)

$2x^3 - 4x^2 - 15x + 1 - 5 = -5$

$2x^3 - 4x^2 - 15x - 4 = -5$

draw $y = -5$

$x = -1.9$ or $x = 0.05$ or $x = 3.9$ ✓

dii) $2x^3 - 4x^2 - 14x - 7 = 0$

$2x^3 - 4x^2 - 14x - x - 7 + 3 = -x + 3$

$2x^3 - 4x^2 - 15x - 4 = -x + 3$

draw $y = -x + 3$

$x = -1.3$ or $x = -0.6$ or $x = 3.95$ ✓

20 cm x 24 cm