

THIRD FORM PROMOTION EXAM 2010

1 0.02856 correct to 3 significant figures is
 0.0286 [C]

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

$$f(x) = 7 \Rightarrow 2x + 1 = 7$$

$$2x = 6$$

$$x = 3$$

So $[3, 7]$ satisfies the function [C]

3 $1 * 2 = (1 - 2(2))^2 = (1 - 4)^2 = (-3)^2 = 9$ [D]

4 $P = k \times \frac{1}{q}$

$$P = \frac{k}{q}$$
 [A]

5 $y = mx$ [B]

6 $\frac{PRT}{100} = I$

$$\frac{1875 \times 3 \times \frac{30}{12}}{100} = \$140.625$$

$$\approx \$140.63$$

7 Meter rental 6.50
 first 150 m³ 25.00
 $270 - 150 = 120 \text{ m}^3$
 $\frac{120}{10} = 12$
 additional m³ used = $12 \times 2.50 = 30.00$
 total bill \$ 61.50

8 $A = 340,000 \left(1 + \frac{8.25}{100}\right)^2$

$= 398,414.125$
 $= \$398,414.13$

9(a) $3m^2n^3 \times 4mn^2 = 12m^3n^5$

(b) $9a^{-5} \times \frac{2}{3}a^6 = 6a$

10 $x(a-b) = b(c-x)$

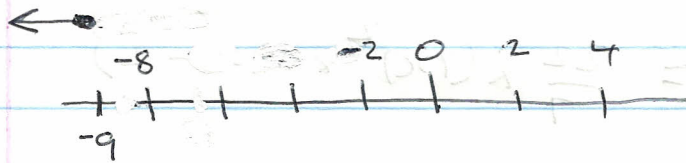
$ax - bx = bc - bx$

$ax = bc - bx + bx$

$ax = bc$

$x = \frac{bc}{a}$

$$\begin{aligned}
 11 \quad & 4(x-2) \geq 5x+1 \\
 & 4x-8 \geq 5x+1 \\
 & 4x-5x \geq 1+8 \\
 & -x \geq 9 \\
 & x \leq -9
 \end{aligned}$$



$$12 \quad \frac{3}{4}x + \frac{1}{2}y = 8$$

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

ADD

$$\frac{5}{4}x = 10$$

$$x = \frac{10 \times 4}{5} = 8$$

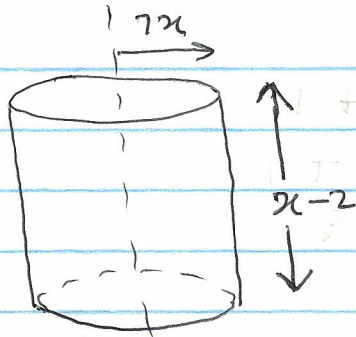
$$\frac{1}{2}(8) - \frac{1}{2}(y) = 2$$

$$4 - \frac{y}{2} = 2$$

$$-\frac{y}{2} = -2$$

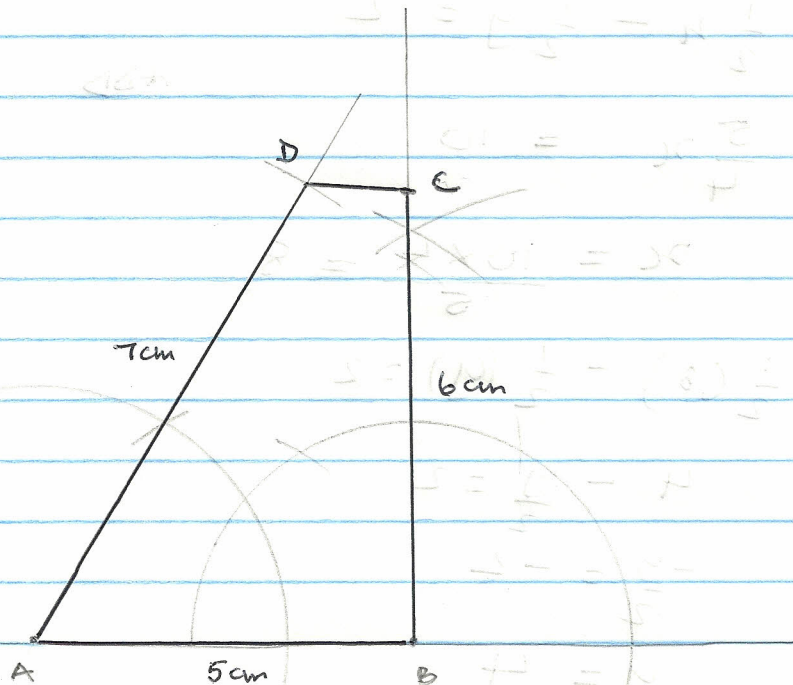
$$y = 4$$

13 (i)



$$\begin{aligned}
 \text{(ii)} \quad V &= \pi R^2 h = \frac{22}{7} \times (7x)^2 \times (x-2) \\
 &= 154x^2(x-2) \text{ cm}^2
 \end{aligned}$$

14

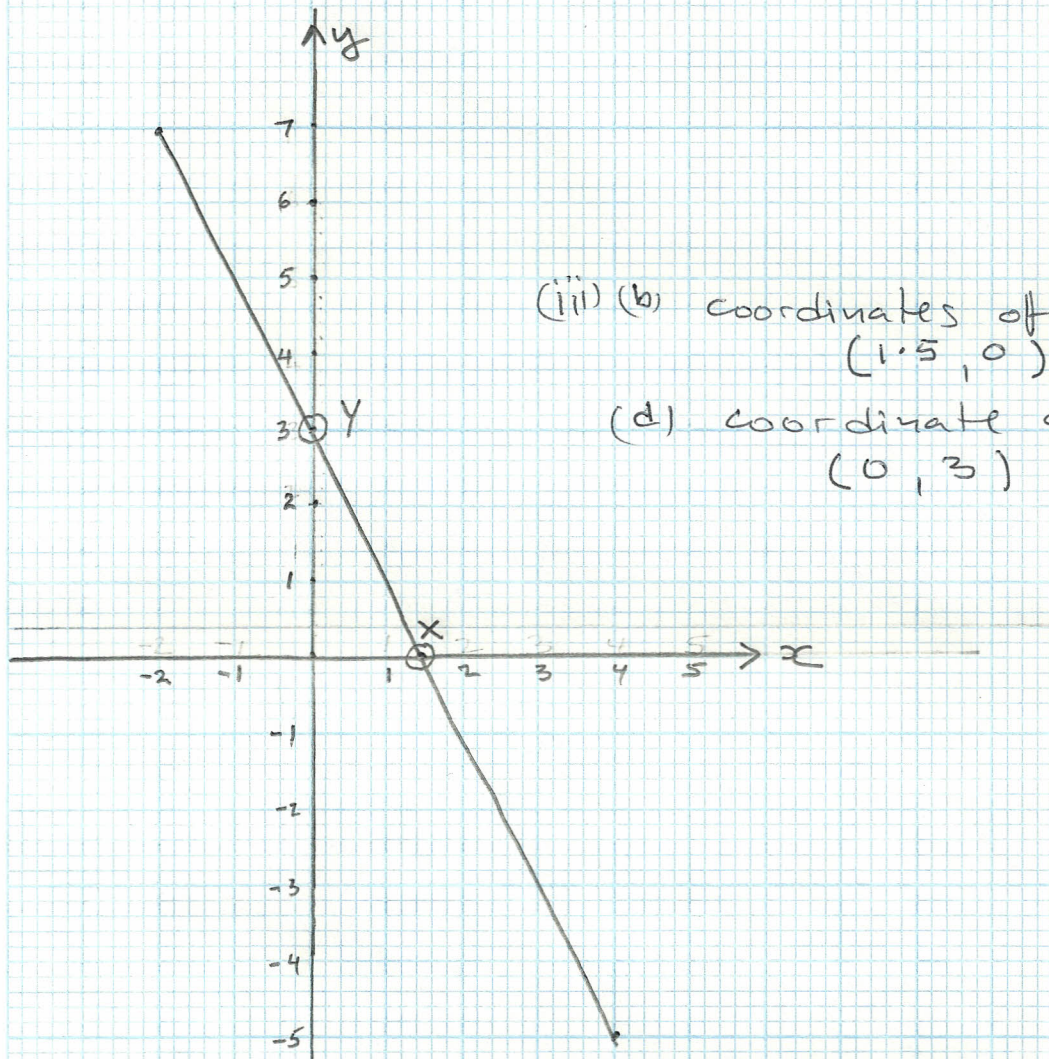


$$CD = 1.5 \text{ cm} \pm 0.1$$

15

$$y = 3 - 2x$$

x	-2	-1	0	1	2	3	4
y	7	5	3	1	-1	-3	-5



(iii) (b) coordinates of the x intercept
(1.5, 0)

(d) coordinate of the y intercept
(0, 3)

(iv) Length of $XY = \sqrt{1.5^2 + 3^2} = \sqrt{11.25} = 3.35$

mid point of $XY = \left(\frac{0+1.5}{2}, \frac{0+3}{2} \right) = (0.75, 1.5)$

gradient of $XY = \frac{-3}{1.5} = -2$

equation of the bisector:

$y = \frac{1}{2}x + c$ or $(y - 1.5) = \frac{1}{2}(x - 0.75)$

$$16 \quad PT = \sqrt{6^2 + 9^2} \\ = \sqrt{117} = 10.8 \text{ cm}$$

$$(ii) \quad \begin{array}{r} \text{Surface area} = 10.8 \times 15 = 162 \\ \frac{1}{2} \times 6 \times 9 \times 2 = 54 \\ 9 \times 15 = 135 \\ 6 \times 15 = 90 \\ \hline 441 \text{ cm}^2 \end{array}$$

$$(iii) \quad \tan(\hat{TPU}) = \frac{6}{9}$$

$$\hat{TPU} = \tan^{-1}\left(\frac{6}{9}\right) = 33.7^\circ$$

17. height	frequency	mid-point	mid point x frequency
150-154	11	152	1672
155-159	11	157	1727
160-164	13	162	2106
165-169	9	167	1503
170-174	6	172	1032
sum	50		8040

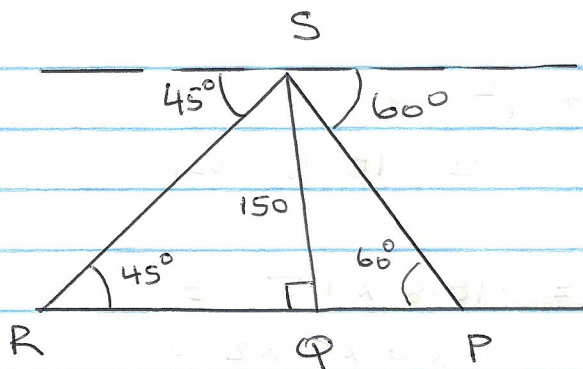
$$(i) \quad \text{no of students} = \text{sum of frequencies} = 50$$

$$(ii) \quad \text{modal class} = 160-164$$

$$(iii) \quad \text{mean height} = \frac{8040}{50} = 160.8 \text{ cm}$$

$$(iv) \quad \text{Probability (at least 164.5 cm)} = \frac{9+6}{50} = \frac{3}{10}$$

18.



$$\tan 60 = \frac{150}{PQ}$$

$$PQ = \frac{150}{\tan 60} = 86.60 \text{ m}$$

$$\tan 45 = \frac{150}{RQ}$$

$$RQ = \frac{150}{\tan 45} = 150 \text{ m}$$

$$RP = 150 + 86.60 = 236.6 \text{ m}$$

$$= 237 \text{ m (to 3 s.f.)}$$