

THIRD FORM PROMOTION EXAM 2011

(1)

1. C
2. A
3. D
4. A
5. D

$$6. \frac{2}{3} x^{-2} \div 6x^{-5}$$

$$= \frac{2}{3x^2} \times \frac{1}{6x^{-5}}$$

$$= \frac{2}{3x^2} \times \frac{x^5}{6}$$

$$= \frac{x^3}{9}$$

$$7. V = \frac{1}{2} r^2 h$$

$$\frac{V}{h} = \frac{r^2}{2}$$

$$\frac{2V}{h} = r^2$$

$$\sqrt{\frac{2V}{h}} = r$$

$$8. 5(2a-1) - 3(4a+1) < 2$$

$$10a - 5 - 12a - 3 < 2$$

$$-2a - 8 < 2$$

$$-2a < 10$$

$$a > -5$$

$$9. \begin{array}{r} 3m - 2n = -7 \quad (\times 5) \\ 11m + 5n = 73 \quad (\times 2) \end{array}$$

$$\begin{array}{r} 15m - 10n = -35 \\ 22m + 10n = 146 \end{array}$$

$$37m = 111 \quad \text{add}$$

$$\Rightarrow m = 3$$

$$\Rightarrow n = 8$$

10. total tax free allowances

= personal allowance	= 3000
+ child	= 1500
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	\$ 4500

taxable income

$$= (\$3500 \times 12) - (4500)$$

$$= 37,500$$

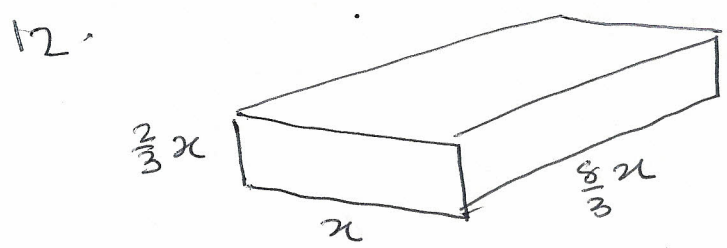
Income tax paid

$$= \frac{25}{100} \times 37500$$

$$= \$9,375 / \text{year}$$

11. Area of ΔPOM
 $= \frac{1}{2} \times 4 \times 4 = 8 \text{ cm}^2$

shaded area
 $= \text{area of sector} - \text{area of triangle POM}$
 $= \frac{90}{360} \times \frac{22}{7} \times 4^2 - 8$
 $= \frac{88}{7} - 8$
 $= \frac{32}{7} \text{ cm}^2$



(i) Volume $= \left(\frac{2}{3}x \times x\right) \times \frac{8}{3}x$
 $= \frac{16}{9}x^3 \text{ cm}^3$

(ii) Surface area
 $= 2\left(\frac{2}{3}x \times x\right) + 2\left(\frac{8}{3}x \times \frac{2}{3}x\right) + 2\left(x \times \frac{8}{3}x\right)$
 $= \frac{4}{3}x^2 + \frac{32}{9}x^2 + \frac{16}{3}x^2$
 $= \frac{92}{9}x^2 \text{ cm}^2$

$$13 \text{ (i)} \quad m = \frac{1 - (-1)}{1 - 4} = \frac{2}{-3}$$

equation of line

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

$$\text{or } y = -\frac{2}{3}x + \frac{5}{3}$$

$$(ii) \quad m = \frac{3}{2}$$

$$(y - 2) = \frac{3}{2}(x + 3)$$

$$y = \frac{3}{2}x + \frac{13}{2}$$

14. (i) number of thefts

$$= (0 \times 3) + (1 \times 7) + (2 \times 10) + (3 \times 14) + (4 \times 12) \\ + (5 \times 12) + (6 \times 8) + (7 \times 4)$$

$$= 253$$

(ii) average number of thefts

$$= \frac{\text{total number of thefts}}{\text{total number of weeks}}$$

$$= \frac{253}{70} = 3.61 \text{ per week.}$$

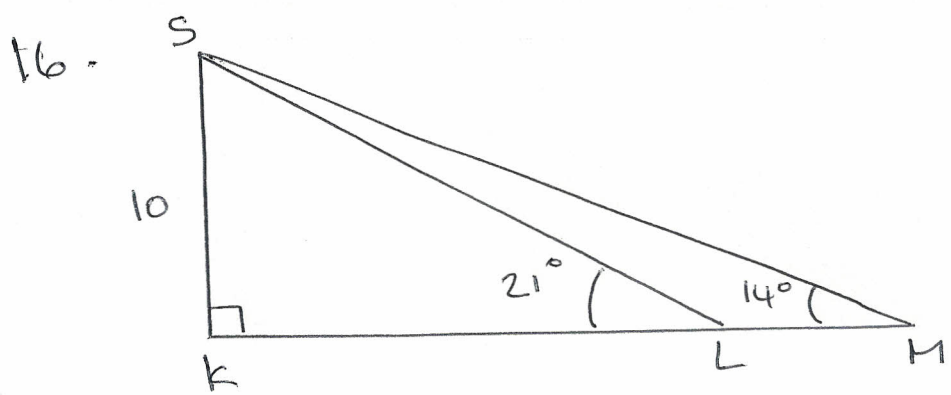
(iii) P.(no more than 3/week)

$$= \frac{3 + 7 + 10 + 14}{70} = \frac{34}{70} = \frac{17}{35}$$

15. (i) modal interval (26 - 30) years

(ii) graph

(iii) Up to age 28 there is an increase in number attending training
After age 28 there is a decrease in the number attending training



(ii) $\tan 21 = \frac{10}{KL}$

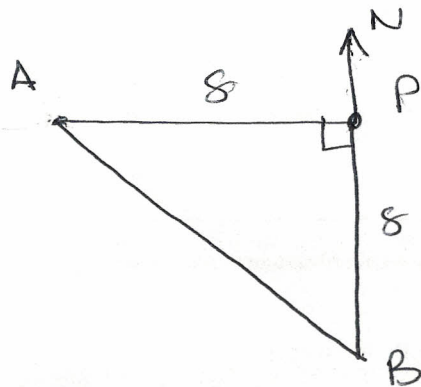
$$KL = \frac{10}{\tan 21} = 26.1 \text{ m}$$

$$\tan 14 = \frac{10}{KM}$$

$$KM = \frac{10}{\tan 14} = 40.1$$

$$LM = KM - KL = 14 \text{ m}$$

17.



$$(ii) \quad AB = \sqrt{8^2 + 8^2} = 11.3 \text{ km}$$

$$(iii) \quad \tan \hat{BAP} = \frac{8}{8} = 1$$

$$\hat{BAP} = \tan^{-1} 1 = 45^\circ$$

$$\begin{aligned} \text{Bearing of B from A} &= 90 + 45 \\ &= 135^\circ \end{aligned}$$