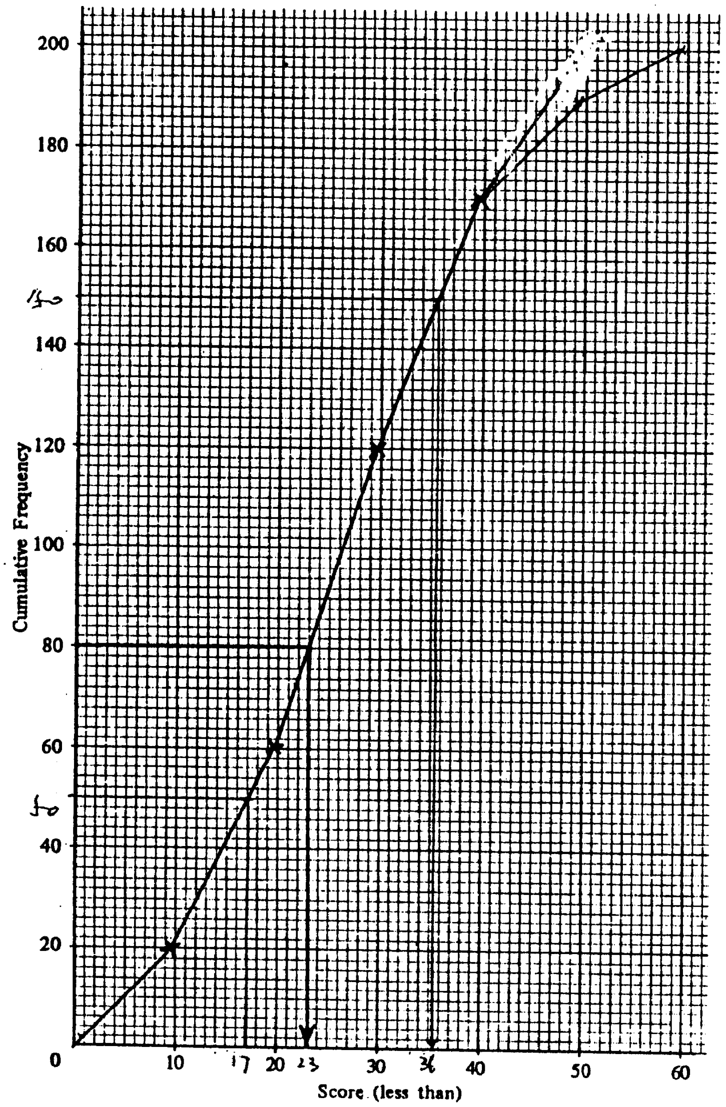
| Solution | Marks | Remarks |
|---|---|---|
| 1. (a) The simple interest = \$1.5 | 1A | |
| (b) $h = 64.3$ | 1A | Any figure roundable to 64.3 |
| (c) $x = \frac{21}{5}$ (= 4.2) | 1A | |
| (d) (i) $x + 2y$ is greatest at (1, 4) 「就依照附答案. | 1A | Accept answers showing in reasonable order (不計較寫在何方) |
| (不計 [illegible]) (ii) $x + 2y$ is least at (0, −3) | 1A | |
| The greatest value is 9. | 1A | |
| The least value is −6. | 1A | for order, [illegible] 有分 |
| (1, 4) ... 9<br>(4, 0) ... 4<br>(−3, 0) ... 3<br>(0, −3) ... −6 0分<br>greatest value = 9<br>least value = −6. 4分 | 7 | |
| 2. (a) $f(3) = 5$ | 1A | |
| (b) $y = \frac{6x - 3}{2x}$ $\left(= 3 - \frac{3}{2x}\right)$ | 1A | |
| (c) $\frac{1}{x - 1} - \frac{1}{x + 1} = \frac{2}{x^2 - 1}$ $\left(= \frac{2}{(x - 1)(x + 1)}\right)$ | 1A | |
| (d) The remainder is 2. | 1A | |
| (e) H.C.F. = $2xy^2$<br>L.C.M. = $12x^2y^3z$ (or $2^2 \cdot 3x^2y^3z$) | 1A+1A | |
| (f) $r = 1$ , $s = -2$ | 1A+1A | |
| (g) $\frac{1}{\sqrt{3} - 1} = \frac{\sqrt{3} + 1}{2}$ | 1A | |
| | 9 | |
| 3. $\frac{\sin\theta + \cos\theta}{\sin\theta - \cos\theta} = \frac{3}{2}$ | | |
| $2\sin\theta + 2\cos\theta = 3\sin\theta - 3\cos\theta$ $\qquad \frac{\frac{\sin\theta}{\cos\theta} + \frac{\cos\theta}{\cos\theta}}{\frac{\sin\theta}{\cos\theta} - \frac{\cos\theta}{\cos\theta}} = \frac{3}{2}$ 1M | | |
| $\sin\theta = 5\cos\theta$ $\qquad \tan\theta = 5$ 1A. | 1A | |
| ∴ $\tan\theta = 5$ | 1M | |
| $\theta = 78.7°$ or $259°$ (多寫一個角扣一分)<br>用radian表示亦可. | 1A+1A | roundable to 78.7°, 259°<br>deduct 1A for each excess answer |
| | 4 | |
| **Remark** | | |
| $\sin\theta = 5\cos\theta$ (same as above) | 1A | |
| $\sin^2\theta = 25\cos^2\theta$ | | |
| $\sin^2\theta = 25(1 - \sin^2\theta)$ 變成全部sine 或全部cosine. | 1M | |
| $\sin^2\theta = \frac{25}{26}$ | | |
| (i) If $\sin\theta = \sqrt{\frac{25}{26}}$ , $\theta = 78.7°$ or $101°$ (rej.) [illegible]要寫rej. | 1A | |
| (ii) If $\sin\theta = -\sqrt{\frac{25}{26}}$ , $\theta = 259°$ or $281°$ (rej.) | 1A | |

| Solution | Marks | Remarks |
|---|---|---|
| 4. $x^2 - x - 2 < 0$ | | |
| $(x+1)(x-2) < 0$ | 1A | for factorization or accept as x=-1,2 |
| $\therefore \quad -1 < x < 2$ | 2A | deduct 1A for any equal sign, accept graphical solution<br>[illegible] |
| Putting $x = y - 100$ , we have $\because (y-100+1)(y-100-2)<0$ | 1M | |
| $-1 < y - 100 < 2$ | | |
| $\therefore \quad 99 < y < 102$ | 2A | |
| | 6 | |
| 5. (a) $9^x = \sqrt{3}$ | | |
| $9^x = 3^{\frac{1}{2}}$ (or $3^{2x} = \sqrt{3}$, $9^{2x} = 3$ etc.) $9^{\frac{1}{4}} = \sqrt{3}$ | 1A | |
| $3^{2x} = 3^{\frac{1}{2}}$ | | |
| $2x = \frac{1}{2}$ $\therefore x = \frac{1}{4}$ (全對) | 1M | equating index with the same base |
| $\therefore \quad x = \frac{1}{4}$ | 1A ③ | |
| **OR** Taking logarithms | | |
| $x\log 9 = \log\sqrt{3}$ | 1M | |
| $x = \dfrac{\log\sqrt{3}}{\log 9}$ | 1A | |
| $= 0.25$ | 1A | |
| (b) $x\left(\dfrac{x^{-1}}{y^2}\right)^{-3} = x\left(\dfrac{1}{xy^2}\right)^{-3}$ | | |
| $= x(xy^2)^3$ | | |
| $= x(x^3y^6)$ | | |
| $= x^4y^6$ | 2M+1A | 1M for correct use of the formula $a^{-n} = \dfrac{1}{a^n}$<br>1M for correct use of the formula $(a^m)^n = a^{mn}$ |
| | ③ 6 | |

| Solution | Marks | Remarks |
|---|---|---|
| 6. (a) $\alpha + \beta = \frac{m}{2}$ } can be anywhere | 1A | |
| $\alpha\beta = \frac{500}{2}$ (= 250) | 1A | |
| The area of the picture = $\alpha\beta$ = 250 | 1A ③ | |
| (b) (i) The perimeter = $2(\alpha + \beta)$ <br> $= 2(\frac{m}{2}) = m$ | 1A ① | |
| (ii) The area of the border <br> $= (\alpha + 4)(\beta + 4) - \alpha\beta$ | 1A+ <br> 1M | [illegible] <br> $(\alpha + 4)(\beta + 4)$ <br> → subtracting answer in (a) |
| $= \alpha\beta + 4(\alpha + \beta) + 16 - \alpha\beta$ | | |
| $= 4(\frac{m}{2}) + 16$ | | |
| $= 2m + 16$ | 1A <br> 7 ③ | |
| **OR** <br> $= 2[2(\beta + 4) + 2\alpha]$ <br> $= 4(\alpha + \beta) + 16$ | 1M+1A | 1M for summation of areas |
| $= 2m + 16$ | 1A | |

7.



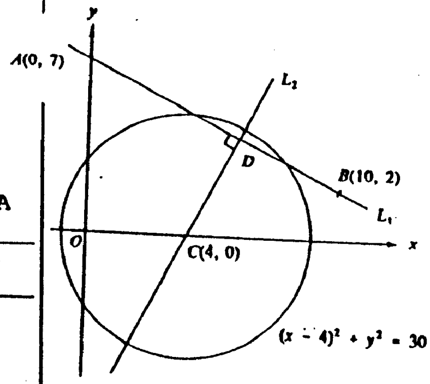
accept plotting the points with error ±0.5

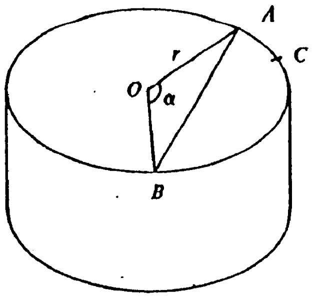
line segment from score 0 to score 9.5 is optional

| Solution | Marks | Remarks |
|---|---|---|
| 7. (a) Cummulative Frequency Table | | |

| Score (less than) | Cummulative Frequency |
|---|---|
| 9.5 | 20 |
| 19.5 | 60 |
| 29.5 | 120 |
| 39.5 | 170 |
| 49.5 | 190 |
| 59.5 | 200 |

| Solution | Marks | Remarks |
|---|---|---|
| | 1A+1A | 1A for any 3 correct |
| | 2 | |
| (b) (i) Cummulative frequency polygon. | 1M+1A | must be line segments<br>1M for following the data in (a)<br>上畫 freq polygon 要對才給分 |
| The upper quartile = 36 (or 35) | | |
| The lower quartile = 17 | | |
| ∴ The interquartile range = 36 − 17 = 19 | 1M+1A | Accept 18±19<br>1M for using the 25% or $(\frac{N+1}{4})$th value, etc. |
| (ii) If the pass percentage is set at 60%, | | |
| the number of students failed would be | | |
| 200 × (1 − 60%) = 80 No. of students passed: 120 | 1M | 80.<br>or horizontal line through 80 on the graph |
| The pass score should be 23 | 1A | |
| | 6 | |
| (c) Mean = 26.5 (exact value). | 1A | Working steps are not required |
| Standard deviation = $\sqrt{166}$ (= 12.9) | 1A | r.t. 12.9 |
| | 2 | |
| (d) The new mean is increased by 20. | 1M | or exact answer |
| i.e. Mean = 26.5 + 20 = 46.5 | | |
| The new standard deviation is unchanged | 1M | or exact answer |
| i.e. Standard deviation = $\sqrt{166}$ (= 12.9) | | |
| | 2 | |

| Solution | Marks | Remarks |
|---|---|---|
| 8. (a) The slope of $L_1 = \frac{2-7}{10-0}\left(= -\frac{1}{2}\right)$ | 1A |  |
| The equation of $L_1$ is $y - 7 = -\frac{1}{2}(x - 0)$<br>i.e. $y = -\frac{1}{2}x + 7$<br>(or $\underline{x + 2y - 14 = 0}$, $5x + 10y - 70 = 0$, etc.) | 1A<br>2 | |
| (b) Slope of $L_1 = -\frac{1}{2}$<br>As $L_2 \perp L_1$, slope of $L_2 = 2$ | 1M | |
| The equation of $L_2$ is<br>$y - 0 = 2(x - 4)$<br>i.e. $y = 2x - 8$ (or $\underline{2x - y - 8 = 0}$, etc.) | 1A<br>② | |
| Solving $\begin{cases} y = -\frac{1}{2}x + 7 \\ y = 2x - 8 \end{cases}$<br>$2x - 8 = -\frac{1}{2}x + 7$ | 1M | 〃成功消去<br>eliminate into 1 unknown |
| The coordinates of $D$ are $x = 6$, $y = 4$ (or $D = (6, 4)$) | 1A<br>②<br>4 | |
| (c) As $AP : PB = k : 1$, the coordinates of $P$ are given by<br>$x = \frac{10k}{1+k}$, $y = \frac{2k+7}{1+k}$ | 1A+1A | |
| Substituting in the equation of the circle,<br>$\left(\frac{10k}{1+k} - 4\right)^2 + \left(\frac{2k+7}{1+k}\right)^2 = 30$ | 1M | |
| $(6k - 4)^2 + (2k + 7)^2 = 30(k + 1)^2$<br>$\therefore$ $10k^2 - 80k + 35 = 0$<br>$2k^2 - 16k + 7 = 0$ .................... (*) $4 \pm \frac{5}{2}\sqrt{2}$ | 1 | |
| $k = \frac{16 \pm \sqrt{16^2 - 4 \times 2 \times 7}}{4} = \frac{8 \pm 5\sqrt{2}}{2}$ (7.54 or 0.464) | 1A | accept $\frac{16 \pm \sqrt{200}}{4}$ |
| As $P$ lies on $AD$, $\frac{AP}{PB} = \frac{8 - 5\sqrt{2}}{2}$ (0.464) | 1M<br>6 | choosing the smaller one from 2 positive values |

| Solution | Marks | Remarks |
|---|---|---|
| 9. (a) (i) Area of the sector $OACB = \frac{1}{2}r^2\alpha$ | 1A |  |
| (ii) Area of $\triangle OAB = \frac{1}{2}r^2\sin\alpha$ (or $r^2\sin\frac{\alpha}{2}\cos\frac{\alpha}{2}$)<br>$\therefore$ area of the segment $ACB$<br>$= \frac{1}{2}r^2\alpha - \frac{1}{2}r^2\sin\alpha$ (or $\frac{1}{2}r^2\alpha - r^2\sin\frac{\alpha}{2}\cos\frac{\alpha}{2}$) | 1M+1A | |
| (iii) As $AB$ divides the circle in the ratio 4:1<br>$\frac{1}{2}r^2\alpha - \frac{1}{2}r^2\sin\alpha = \frac{1}{5}\pi r^2$ | 1M | correct use of the ratio 4:1 |
| $\therefore \sin\alpha = \alpha - \frac{2\pi}{5}$ | 1 | |
| **Remark**<br>$\dfrac{\frac{1}{2}r^2(2\pi - \alpha) + \frac{1}{2}r^2\sin\alpha}{\frac{1}{2}r^2\alpha - \frac{1}{2}r^2\sin\alpha} = 4$ | 1M | |
| $\pi r^2 - \frac{1}{2}r^2\alpha + \frac{1}{2}r^2\sin\alpha = 2r^2\alpha - 2r^2\sin\alpha$<br>$\therefore \sin\alpha = \alpha - \frac{2\pi}{5}$ | 1A | |
| (iv) Let $f(\alpha) = \sin\alpha - \alpha + \frac{2\pi}{5}$<br>$f(2.1)(\approx 0.0198) > 0$<br>$f(2.2)(\approx -0.1349) < 0$<br>$\therefore f(\alpha) = 0$ has a root between 2.1 and 2.2 . | 1 | **OR**<br>$f(\alpha) = \alpha - \sin\alpha - \frac{2\pi}{5}$<br>$f(2.1) < 0$<br>$f(2.2) > 0$<br>for showing opposite signs |

$\left\{\begin{array}{l} f(2.1) < 0 \\ f(2.2) > 0 \end{array}\right.$ 亦可

(v)

| Interval | Mid-value $\alpha_i$ | $f(\alpha_i)$ |
|---|---|---|
| $2.1 < \alpha < 2.2$ | 2.15 | −ve (−0.056) |
| $2.1 < \alpha < 2.15$ | 2.125 | −ve (−0.018) |
| $2.1 < \alpha < 2.125$ | 2.1125 | +ve (0.00097) |
| $2.1125 < \alpha < 2.125$ | 2.11875 | −ve (−0.0085) |
| $2.1125 < \alpha < 2.11875$ | 2.115625 | −ve (−0.0038) |
| $2.1125 < \alpha < 2.115625$ | 2.1140625 | −ve (−0.0014) |
| $2.1125 < \alpha < 2.1140625$ | (f.p. 亦可) | |

| Marks | Remarks |
|---|---|
| 1M+1A | first correct sign<br>Testing sign at mid-value |
| 1M | Correct choice of next interval<br>Accept using smaller or larger starting intervals |

$\therefore \alpha \approx 2.11$ (corr. to 2 d.p.)

(以後級之 +, − 號 [illegible] 可免寫 interval)

| Marks | Remarks |
|---|---|
| 1A | Check whether it is bounded by the last interval |
| 10 | |

| Solution | Marks | Remarks |
|---|---|---|
| (b) As the curved surface has uniform height,<br>ratio of the curved surface areas of the two parts<br>= ratio of the corresponding arc lengths.<br>$= r(2\pi - \alpha) : r\alpha$ OR $(2\pi - \alpha) : \alpha$ | 1M | OR $r\alpha : (2\pi - \alpha)$<br>OR $\alpha : 2\pi - \alpha$ |
| $= 2\pi - 2.11 : 2.11$<br>$\approx 1.98 : 1$ | 1A | 不得分 1 之位置 [illegible]<br>r.t. 1.98 |
| | 2 | |
| **OR** Let the height be $h$ .<br>$\therefore$ ratio required $= r(2\pi - \alpha)h : r\alpha h$ | 1M | |
| $= \ldots$<br>$\approx 1.98 : 1$ | 1A | |

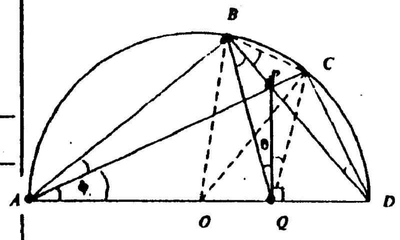
| Solution | Marks | Remarks |
|---|---|---|
| 10. (a) The annual food production in | | |
| (i) the 3rd year $= 8 + 1 \times 2$ | | |
| $= 10$ (or 10 (million tonnes)) | 1A | $u-1$ for $10\times10^6$ or $10\times10^6$ million tonnes |
| (ii) the $n$th year $= 8 + (n-1)$ — or 加上單位 (million tonnes). | 1A | |
| $= 7 + n$ | | |
| | 2 | |
| (b) The total food production in the first 25 years | | |
| $= \frac{25}{2}[2\times8+(25-1)\times1]$ or $\frac{25}{2}[8+8+(25-1)\times1]$ | 1A | |
| $= 500$ | 1A | |
| | 2 | |
| (c) The population of the country at the end of | | |
| (i) the 3rd year $= 2\times(1+6\%)^2$ | | |
| $= 2.25$ million | 1A | r.t. 2.25 |
| (ii) the $n$th year $= 2\times(1+6\%)^{n-1}$ million<br>(or $2\times1.06^{n-1}$ million) | 1A | |
| | 2 | |
| (d) For the population to be doubled, | | |
| $2\times(1+6\%)^n = 4$ (≥ 亦可) | 1M | accept "answer of c(ii) = 4" |
| Taking logarithm $n\log1.06 = \log2$ | 1M | for taking lograithm |
| $n = \frac{\log2}{\log1.06} = 11.9$ | | |
| The minimum number of years for the population to be doubled is 12 years. | 1A | accept values r.t. 11.9 |
| | 3 | |
| (e) The annual food production per capita of the 100th year | | |
| $= \frac{7+100}{2\times1.06^{99}}$ | 1M+1A | 1M for substituting $n$=100 to $\frac{\text{ans.of(a)(ii)}}{\text{ans.of(c)(ii)}}$ |
| $= 0.167$ | | |
| $< 0.2$ | | |
| ∴ the country will face a food shortage problem. | 1M | corresponding logical conclusion |
| | 3 | |

$2\times(1+6\%)^y$

[illegible]

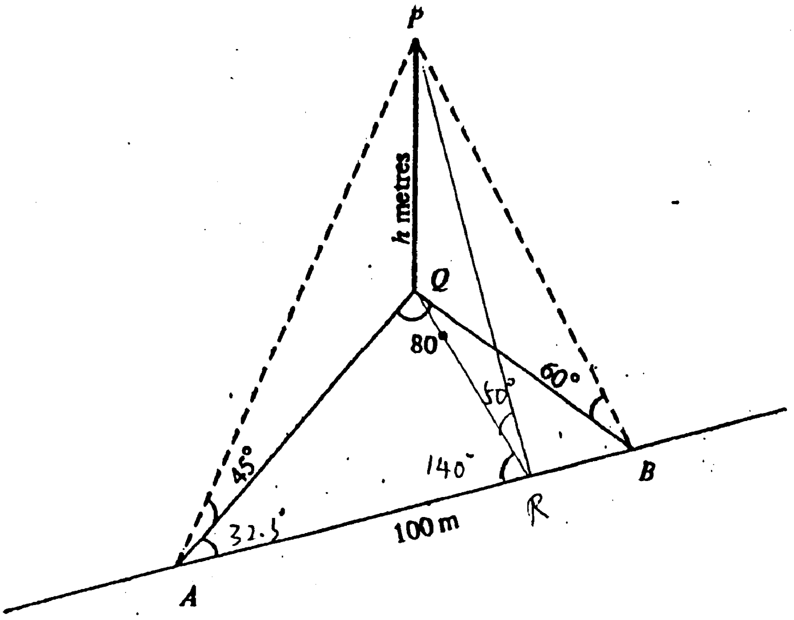
1M

1M

| Solution | Marks | Remarks |
|---|---|---|
| 11. (a) Join $AB$ . | | |
| $\angle ABD = 90°$ ( $\boxed{\angle \text{ in a semicircle}}$ ) | 1 | accept "semicircle" or "diameter" |
| and $\angle AQP = \boxed{90°}$ (Given) 缺 degree u-1 | 1 | |
| $\therefore$ $\angle ABD + \angle AQP = \boxed{180°}$ 缺∠符號 u-1 | 1 | |
| $\therefore$ $AQPB$ is a cyclic quadrilateral. (Opp. $\angle$s supp.)<br>i.e. $A$ , $Q$ , $P$ , $B$ are concyclic. | 3 |  |
| (b) (i) Join $CD$ . | | |
| Using the same argument as in (a), it can be shown that $PQDC$ is a cyclic quadrilateral. | | |
| $\therefore$ $\angle PQC = \boxed{\angle PDC \text{ (or } \angle BDC)}$ ($\angle$s in the same segment) | 1 | |
| Now consider the cyclic quadrilateral $ADCB$ . | | |
| $\angle BDC = \boxed{\angle BAC \text{ (or } \angle BAP)}$ ($\angle$s in the same segment) | 1 | |
| As $AQPB$ is a cyclic quadrilateral, | | |
| $\angle BAP = \boxed{\angle BQP \text{ (or } \theta)}$ ($\angle$s in the same segment) | 1 | |
| $\therefore$ $\angle BQC = \angle BQP + \angle PQC$ | | |
| In terms of $\theta$ , | | |
| $\angle BQC = \boxed{2\theta}$ | 1 | |
| (ii) Consider the given semi-circle. | | |
| $\angle BOC = 2 \times \angle BAC$ $\boxed{\angle \text{ at centre = twice } \angle \text{ at } \odot^{ce}}$ | 1 | accept "$\angle$ at centre" or "O is the centre" |
| But $\angle BAC = \theta$ (Proved) (edge. side 亦可) | | |
| $\therefore$ $\angle BOC = \boxed{2\theta}$ | 1<br>6 | |
| (c) Solution : | | |
| Consider the quadrilateral $AQPB$ . | | |
| $\angle PBQ$ (= $\angle PAQ$) = $\phi$ | 1 | |
| But in the given semi-circle, | | |
| $\angle CBD$ (= $\angle CAD$) = $\phi$ | 1 | |
| $\therefore$ $\angle CBQ = \angle CBD + \angle PBQ$ | | |
| $= 2\phi$ 只得答 亦有1分 | 2 1<br>3 | 上面3行齊 只有答案對 亦可得1分 |
| **OR** | | |
| $\because$ $\angle BQC = \angle BOC$ | | |
| $\therefore$ $B$, $O$, $Q$, $C$ are concyclic | 1 | |
| Hence $\angle CBQ = \angle COQ$ | 1 | |
| $= 2\angle CAD$ | | |
| $= 2\phi$ | 1 | |

| Solution | Marks | Remarks |
|---|---|---|
| 12. (a) (i) As $PQ$ is perpendicular to the plane $ABQ$ | | |
| $\tan 45° = \frac{PQ}{AQ}$ and $\tan 60° = \frac{PQ}{BQ}$<br>(或 $PQ=AQ$) | 1A | for either |
| $\therefore$ $AQ = \frac{h}{\tan 45°} = h$ metres | 1A | |
| $BQ = \frac{h}{\tan 60°} = \frac{h}{\sqrt{3}}$ metres (or $0.577h$) | 1A | r.t. 0.577 |
| (ii) Consider $\triangle ABQ$ . | | |
| By the cosine rule, | | |
| $AB^2 = AQ^2 + BQ^2 - 2AQ \cdot BQ \cos \angle AQB$ | | |
| $100^2 = h^2 + (\frac{h}{\sqrt{3}})^2 - 2(h)(\frac{h}{\sqrt{3}}) \cos 80°$ | 1M+1A | |
| $= 1.13282h^2$ | | |
| $\therefore$ $h = 94.0$ (93.9549) | 1A | r.t. 94.0 |
| Consider $\triangle ABQ$ again. | | |
| By the sine rule, $\frac{BQ}{\sin \angle QAB} = \frac{AB}{\sin \angle AQB}$, | | |
| $\frac{\frac{93.9549}{\sqrt{3}}}{\sin \angle QAB} = \frac{100}{\sin 80°}$ | 1M | |
| $\therefore$ $\sin \angle QAB = \frac{93.9549 \times \frac{1}{\sqrt{3}} \sin 80°}{100} = 0.5342$ | | |
| $\angle QAB = 32.3°$ (32.2902°) | 1A | r.t. 32.3<br>accept 32°15′-32°21′ |
| | 8 | |
| **OR** | | |
| ... | | |
| By the cosine rule, | | |
| $QB^2 = AQ^2 + AB^2 - 2(AQ)(AB) \cos \angle QAB$ | | |
| $\left(\frac{93.9549}{\sqrt{3}}\right)^2 = 93.9549^2 + 100^2 - 2 \times 93.9549 \times 100 \cos \angle QAB$ | 1M | |
| $\cos \angle QAB = 0.8454$ | | |
| $\angle QAB = 32.3°$ | 1A | |

| Solution | Marks | Remarks |
|---|---|---|
| (b) Consider $\triangle PQR$ . | | |
| $\tan 50° = \dfrac{h}{QR}$ | 1M | |
| $\therefore \quad QR = \dfrac{h}{\tan 50°}$ metres | | |
| Consider $\triangle AQR$ . | | |
| By the sine rule, $\dfrac{QR}{\sin\angle QAR} = \dfrac{AQ}{\sin\angle ARQ}$ | | |
| $\dfrac{\frac{h}{\tan 50°}}{\sin 32.2902°} = \dfrac{h}{\sin\angle ARQ}$ | 1M | |
| $\angle ARQ = \sin^{-1}(\sin 32.2902° \tan 50°)$ | | |
| $= \sin^{-1} 0.636644$ | | |
| $= 140.45796°$ (as it is obtuse) | 1A | r.t. 140-141 |
| $\therefore \quad \angle AQR = 180° - 140.45796° - 32.2902°$ | | |
| $= 7.2518°$ | | |
| Using the sine rule again. | | |
| $AR = \dfrac{AQ \sin 7.2518°}{\sin 140.45796°}$ | | |
| $= 18.6$ m | 1A | r.t. 18.4-18.7 |
| | 4 | |



$QR^2 = AQ^2 + AR^2 - 2AQ \cdot AR \cos 32.29°$ (1M)

$(78.8575)^2 = (85.854)^2 + AR^2$

$- 2 \times (85.854) AR \cos 32.29°$

$AR^2 - 158.8 AR + 2611.17 = 0$ (1M

$AR = 18.64$ or $AR = 140.8$ (rejected)

$AR = 18.6$ (1A)

| Solution | Marks | Remarks |
|---|---|---|
| 13. (a) (i) The prob. that the elections in the Tuen Mun and Yuen Long constituencies would both be won by the Democrats | | |
| $= 0.65 \times 0.45$ | 1A | |
| $= 0.2925$ | 1A | r.t. 0.293<br>accept $\frac{117}{400}$ or $\frac{2925}{10000}$ |
| (ii) The prob. that the elections in the two constituencies would both be won by the Liberals | | |
| $= (0.25 + 0.1) \times 0.55$<br>$= 0.1925$ | 1A | |
| ∴ the probability that the elections in the two constituencies would both be won by the same party | | |
| $= 0.2925 + 0.1925$ | 1M | |
| $= 0.485$ | 1A | r.t. 0.485-0.486<br>accept $\frac{97}{200}$ or $\frac{485}{1000}$ |
| | 5 | |
| (b) (i) The probability that a vote came from the Tuen Mun constituency and was for 'The Democrats' | | |
| $= \frac{40000 \times 70\%}{60000}$ (or $\frac{28000}{60000}$) | 1A | |
| $= \frac{7}{15}$ (or 0.467) | | |

| Candidate | No. of votes |
|---|---|
| A | 28000 |
| B | 8000 |
| C | 4000 |
| P | 8000 |
| Q | 12000 |

| | | |
|---|---|---|
| The probability that both votes came from the Tuen Mun constituency and were for 'The Democrats' | | |
| $= \left(\frac{7}{15}\right)^2$ | 1M | |
| $= \frac{49}{225}$ (or 0.218) | 1A | r.t. 0.218 |
| (ii) The probability that a vote was for 'The Democrats' | | |
| $= \frac{40000 \times 70\% + 20000 \times 40\%}{60000}$ $\left(\text{or } \frac{28000 + 8000}{60000}\right)$ | 1A | |
| $= \frac{3}{5}$ (or 0.6) | | $\frac{28000}{60000}$ $\frac{8000}{60000}$ |
| The probability that both votes were for 'The Democrats'. | | |
| $= \left(\frac{3}{5}\right)^2 = \frac{9}{25}$ ✓ (or 0.36) | 1A | $\frac{28000}{60000}$ $\frac{8000}{60000}$ |
| (iii) The probability that a vote was for 'The Liberals' | | |
| $= \frac{8000 + 4000 + 12000}{60000}$ (or $1 - \frac{3}{5}$)<br>$= \frac{24000}{60000} = \frac{2}{5}$ | | |
| The probability that both votes were for different parties | | |
| $= 1 - (\frac{3}{5})^2 - (\frac{2}{5})^2$ or $2 \times \frac{3}{5} \times \frac{2}{5}$ | 1A | |
| $= \frac{12}{25}$ (or 0.48) | 1A | |
| | 7 | |