CATHOLIC HIGH SCHOOL
END-OF-YEAR EXAMINATION (2007)
SECONDARY THREE MATHEMATICS PAPER 1

Subject : **Mathematics** Paper : **1**

Level : **Secondary 3** Date :

Marks : **80** Time : **08 00 – 10 00**

Name : _____ ( )

Class : **Sec 3 -** ____

READ THESE INSTRUCTIONS FIRST:

Write your name, class and index number on all the work you hand in.
Write in dark blue or black pen in the spaces provided on the Question Paper.
You may use a pencil for any diagrams or graphs.
Do not use staples, paper clips, highlighters, glue or correction fluid.

Answer **all** questions.
If working is needed for any question it must be shown in the space below that question.
Omission of essential working will result in loss of marks.
You are expec

The number of marks is given in brackets [ ] at the end of each question or part question.

The total of the marks for this paper is 80.

ELECTRONIC CALCULATORS MAY BE USED IN THIS PAPER

For Examiner's Use Only:

Types	Qn No.	Types	Qn No.
Accuracy		Graphs	
Brackets		Diagrams	
Fractions		Geometry	
Units		Others	

This question paper consists of 15 printed pages, including this cover page.

1 Expand and simplify $(x+1)^2 - x(x+2) - 1$.

Answer : _____ [2]

2 Factorise completely

(a) $3x - 18x^2$,

(b) $x^2 + 5x - 14$.

Answer : (a) _____ [1]

(b) _____ [1]

3 Express as a fraction in its simplest form

$$\frac{1}{x+3} - \frac{x}{4-x}.$$

Answer : _____ [2]

4. Solve the equation by either factorisation or a formula method.

$6x^2 - 17x + 7 = 0$

Answer : _____ [2]

5. Solve the simultaneous equations by either elimination or substitution method.

$4x = y + 9$

$2x - 3y = -23$

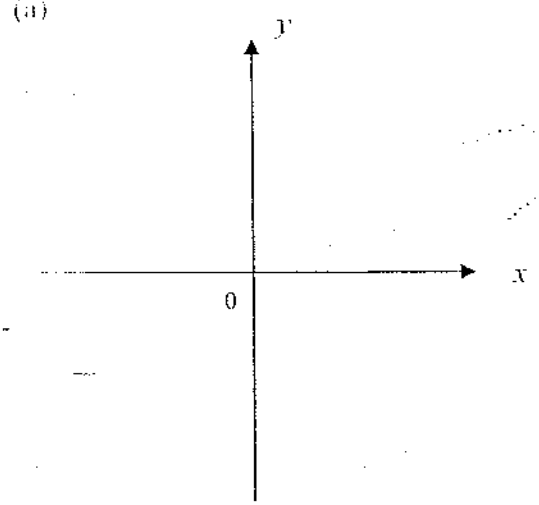
Answer : _____ [2]

On the axes in the answer space, sketch the graphs for each of the following functions.

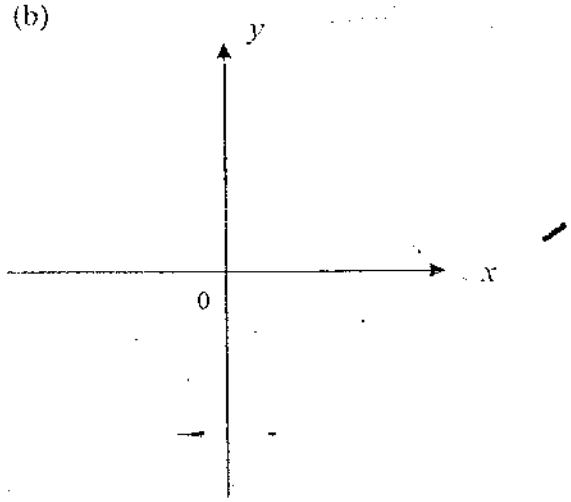
[1]

[1]

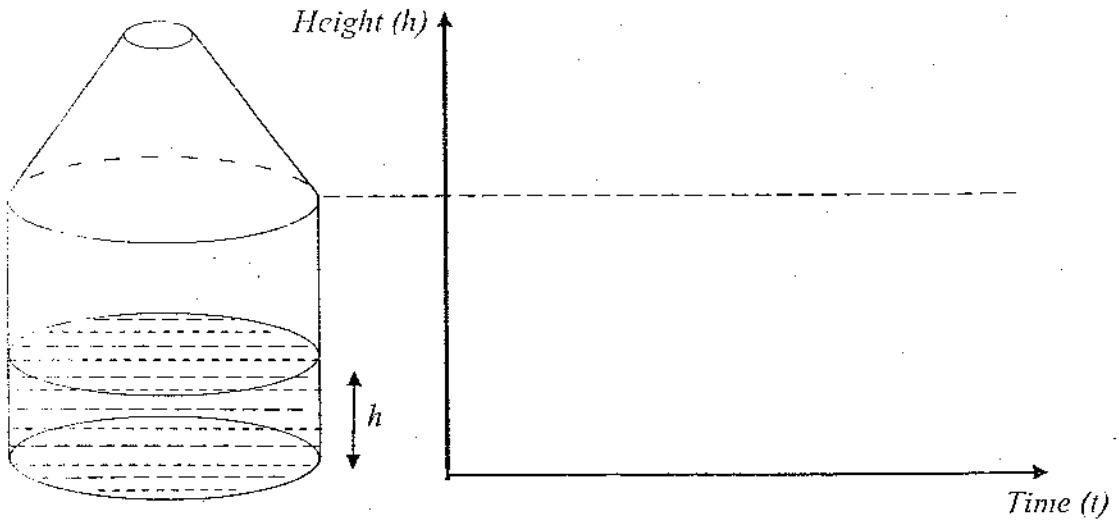
(a)



(b)



7 The container shown below is made up of a cylinder and a funnel. If water is being poured in from the top of the container at a constant rate, sketch , on the axes, the graph of the height of the water against the time taken. [2]



8. In the diagram, XMY is a straight line and XN is a diameter of the smaller circle XMN. [2]
Prove that YN is a diameter of the larger circle YMN.

Y

M

X

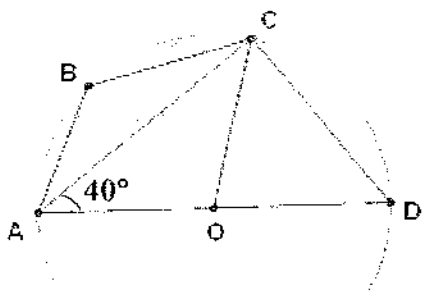
N

9 In the diagram, O is the centre of the circle and $\angle CAD = 40°$.

Find

(a) $\angle ABC$,

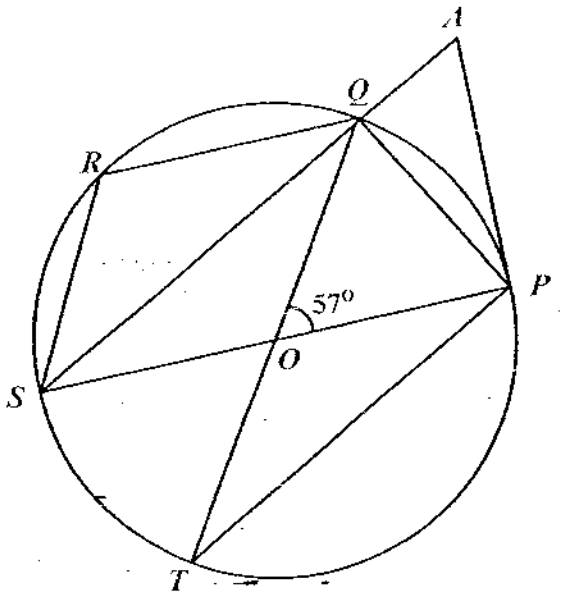
(b) $\angle OCD$.



Answer : (a) _____ ° [2]
°

(b) _____ [2]

(a) A circle, centre O, passes through P, Q, R, S and T. AP is the tangent to the circle at P. It is given that SQA is a straight line and $\angle POQ = 57°$.



(a) State the reason for $\angle SQP = 90°$.

(b) Find

(i) PSQ,

(ii) PTQ,

(iii) $\angle SRQ$.

Answer : (a) _____ [1]

(b)(i) _____ ° [1]

(ii) _____ ° [1]

(iii) _____ [1]

11. Given $A = \begin{pmatrix} 2 & -3 \\ 5 & 7 \end{pmatrix}$, $B = \begin{pmatrix} 9 & 11 \\ 2 & -1 \end{pmatrix}$ and $C = \begin{pmatrix} 17 & 13 \\ 2 & 4 \end{pmatrix}$, find

(a) $A - C$,

(b) $2A + B$.

Answer : (a) _____ [1]

(b) _____ [2]

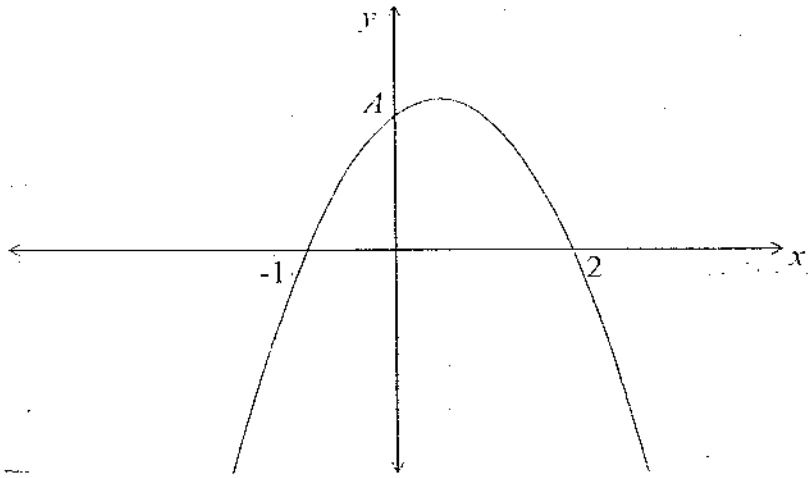
12. Given that $\begin{pmatrix} 2 & 8 \\ -5 & 1 \end{pmatrix}\begin{pmatrix} x \\ 2 \end{pmatrix} = \begin{pmatrix} 8 \\ 2y \end{pmatrix}$, find the values of x and of y.

Answer : $x =$ _____, $y =$ _____ [3]

13. The diagram shows the graph of $y = (1 + x)(2 - x)$.

(a) The graph cuts the y-axis at $A(0, p)$. Write down the value of p.

(b) Given that the point $B(q, -4)$ lies on the curve, find a possible value of q.



Answer : (a) _____ [1]

(b) _____ [2]

14. The equation of the line l is $3y - x = 10$. Find

(a) the gradient of the line l,

(b) the equation of the line which is parallel to l and which passes through the point (6, 10).

Answer : (a) _____ [1]

(b) _____ [2]

15. The points A and B are $(1, -1)$ and $(-2, 5)$ respectively. Calculate

(a) the gradient of the line AB,

(b) the equation of the line passing through A and B,

(c) the distance between A and B.

Answer : (a) _____ [1]

(b) _____ [2]

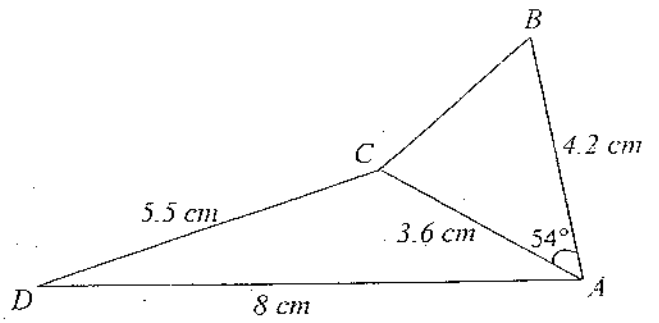
(c) _____ [2]

16. In the diagram, $\hat{BAC} = 54°$, $AB = 4.2$ cm, $AC = 3.6$ cm, $CD = 5.5$ cm and $AD = 8$ cm.

Calculate

(a) $\hat{ACD}$,

(b) the area of ΔABC.



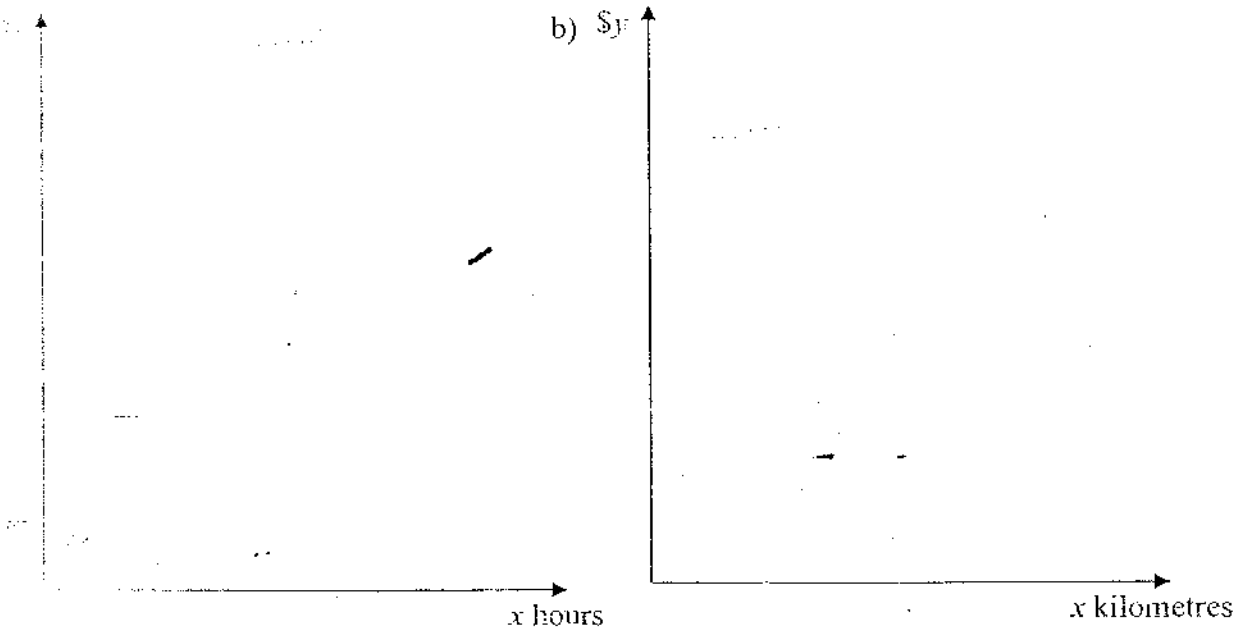
Answer : (a) _____ ° [2]

(b) _____ cm^2 [2]

In the axes below, draw the graphs which illustrate each of the following statements:

(a) The cost of repair of y dollars of a computer which consists of a transport cost of $50 plus x hours of labour charge at $10 per hour. [2]

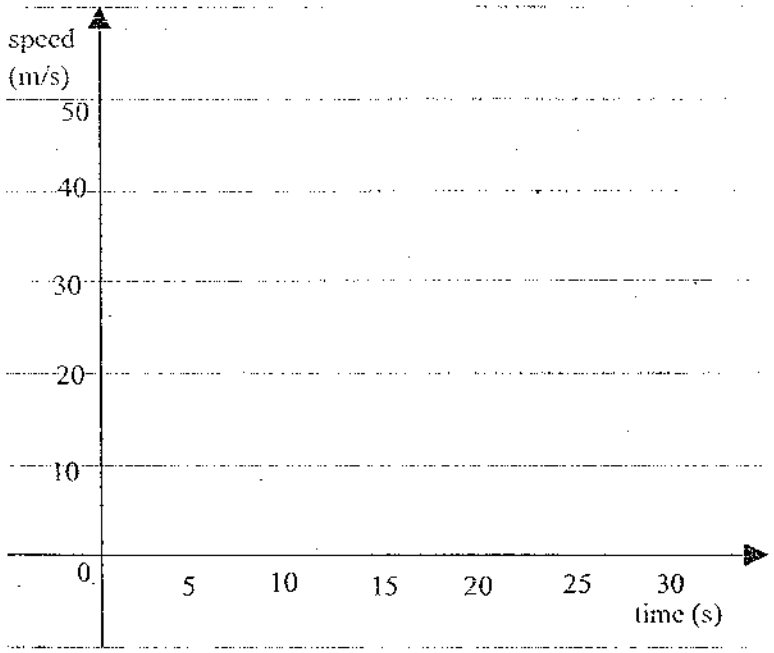
(b) The taxi fare, y dollars, which cost $3.20 for the first x kilometers and at a rate of $0.20 for every additional kilometer travelled thereafter. [2]



A Toyata Sedan accelerates uniformly from rest to a speed of 40 m/s in 10 seconds. It then travels at this speed constantly for the next 15 seconds.

(a) Draw the speed-time graph on the grid below. [2]

(b) Calculate the distance travelled in the first 25 seconds.

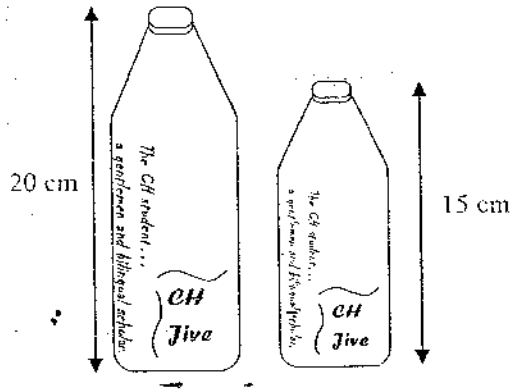


Answer : (b) _____ m [2]

19 During the CHS Homecoming funfair, class 3-12 was selling an isotonic drink called CH Jive to raise funds. CH Jive is sold in bottles of two sizes. The bottles are geometrically similar to each other. The heights of the larger bottle and the smaller bottle are 20 cm and 15 cm respectively.

(a) If the surface area of the larger bottle is A cm^2, express the surface area in cm^2 of the smaller bottle in terms of A.

(b) The capacity of the smaller bottle is 270 ml. Calculate the capacity of the larger bottle.



Answer : (a) _____ [2]
ml

(b) _____ [2]

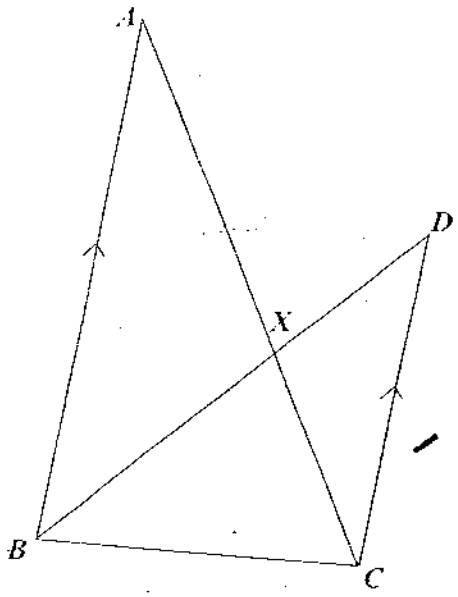
(b) In the diagram, AB is parallel to DC and AC and BD meet at X.

(i) Prove that ΔABX and ΔCDX are similar. [2]

(ii) $DC = 12$cm, $DX = 6$ cm, $XB = 9$ cm.

(a) Find AB.

(b) Find $\dfrac{\textit{Area of } \Delta CBD}{\textit{Area of } \Delta CBX}$.



Answer : (b)(i) cm [1]

(ii) [2]

21. The table shows the number of hours that a group of students spent doing C.I.P during the June holidays.

No. of hours	2	3	4	5
No. of matches	12	9	4	x

(a) If the mean is 3, calculate the value of x.
(b) If the mode is 2, write down the largest possible value of x.
(c) If the median is 3, write down the largest possible value of x.

Answer : (a) _____ [2]

(b) _____ [1]

(c) _____ [1]

22. The height of each of the 500 pupils in Catholic High School was measured. The results are shown in the following table.

(a) State

(i) the modal class,

(ii) the median class of this distribution.

(b) Fill in the table below and hence calculate the estimated mean height of the 500 pupils in Catholic High School.

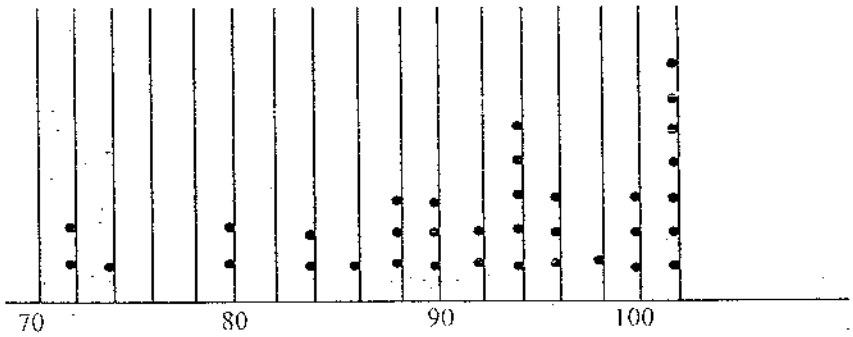
Height (in cm)	**Number of pupils, (f_i)**	**Mid-value of class intervals (x_i)**	$f_i x_i$
$120 < x \leq 130$	10		
$130 < x \leq 140$	50		
$140 < x \leq 150$	120		
$150 < x \leq 160$	160		
$160 < x \leq 170$	110		
$170 < x \leq 180$	45		
$180 < x \leq 190$	5		

Answer : (a)(i) _____ [1]

(ii) _____ [1]

(b) _____ cm [2]

A class of 35 students took a Mathematics Mastery Review. The results are displayed in the dot diagram.



Test score

For the whole class, write down

(i) the modal score,

(ii) the median score.

(b) Using the above data, complete the single ordered stem-and-leaf diagram to represent the scores of all 35 students.

[2]

Stem	Leaf
7	2 2 4
8	0 0 4 4 6 8 8 8
9	0 0 0 2 2

Answer : (a)(i) _____ [1]

(ii) _____ [1]

24. Three tour agencies, Ang Sisters' Tours, Bon Voyage Tours and CU Again Tours has a fleet of coaches of 3 different sizes. Double-decked has 52 seats, Deluxe has 30 seats and Standard has 24 seats. These tour agencies have the following number of coaches:

	Double- decked	Deluxe	Standard
Ang Sisters' Tours	13	10	8
Bon Voyage Tours	8	6	20
CU Again Tours	11	4	5

(a) Write down two matrices whose product will show the greatest number of tourists that each tour company can take on a day when each coach is used once. Hence, evaluate this product.

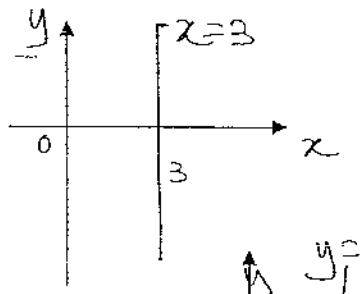
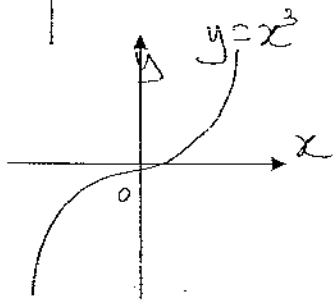
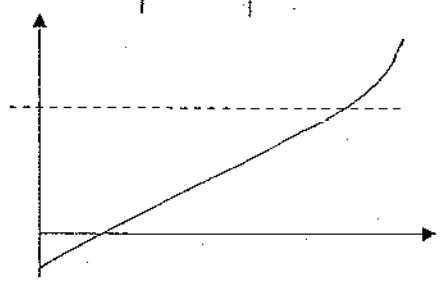
(b) Ang Sisters' Tours charges \$10.50 per seat, Bon Voyage Tours charges \$9.50 per seat and CU Again Tours charges \$11.50 per seat. Express the maximum total earnings for the Tour companies as a product of two matrices and hence, find the total earning.

Answer : (a) [3]

(b) \$ [3]

End of Paper

Answer Key

1.	O
2.(a)	$3x\left(1-6x\right)$
2.(b)	$\left(x+7\right)\left(x-2\right)$
3.	$\frac{-x^2-4x+4}{\left(x+3\right)\left(4-x\right)}$
4.	$2\frac{1}{3}$ *or* $\frac{1}{2}$
5.	$x = 5, y = 11$
6.(a)	
6.(b)	
7.	
9. (a)	$\hat{ABC} = 130^o$
9. (b)	$\hat{OCD}$ 50^o
10. (a)	*Rt. ∠ in semicircle*
10. bi)	$\hat{PSQ} = 28.5^o$
10. bii)	$\hat{PTQ} = 28.5^o$
10. biii)	$\hat{SRQ} = 118.5^o$
11. (a)	$\begin{pmatrix} -15 & -16 \\ 3 & 3 \end{pmatrix}$
11. (b)	$\begin{pmatrix} 13 & 5 \\ 12 & 13 \end{pmatrix}$
12.	*x = - 4 , y = 11*
13. (a)	*p = 2*
13. (b)	*Possible values of q: 3, -2*
14. (a)	$\frac{1}{3}$
14. (b)	$y = \frac{1}{3}x + 8$
15. (i)	-2
15.(ii)	$y = -2x + 1$
15. (iii)	6.71
16. (a)	121.7^o
16. (b)	6.12 cm^2

CATHOLIC HIGH SCHOOL

END-OF-YEAR EXAMIANTION (2007)

Secondary 3

MATHEMATICS 4016/02

Paper 2

2 hours 30 minutes

Additional Materials: Answer paper (Booklet A)
Answer paper (Booklet B) with graph paper (1 sheet)

READ THESE INSTRUCTIONS FIRST

Write your name, index number and class on every piece of writing/graph paper.
Write in dark blue or black pen.
You may use a pencil for any diagrams or graphs.
Do not use staples, paper clips, highlighters, glue or correction fluid/tape.

Answer **all** questions.
If working is needed for any question it must be shown with the answer.
Omission of essential working will result in loss of marks.
Calculators should be used where appropriate.
If the degree of accuracy is not specified in the question, and if the answer is not exact, give the answer to three significant figures. Give answers in degrees to one decimal place.
For π, use either your calculator value or 3.142, unless the question requires the answer in terms of π.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.
The total marks for this paper is 100.

This question paper consists of 10 printed pages, including the cover page.

Answer all questions.

1 (a) (i) Factorize completely $4p^2 - 36$. [2]

(ii) Simplify $\dfrac{4p^2 - 36}{5p^2 + 8p - 21}$. [2]

(b) Simplify $(x-2)(2x+3) - 2(x+1)^2$. [2]

(c) Given that $\dfrac{1}{a} = \dfrac{1}{b} - \dfrac{1}{c}$, express c in terms of a and b. [2]

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2 A world champion Fernando Alonso completes the Malaysian Grand Prix, a distance of 310 km at an average speed of x km/h.

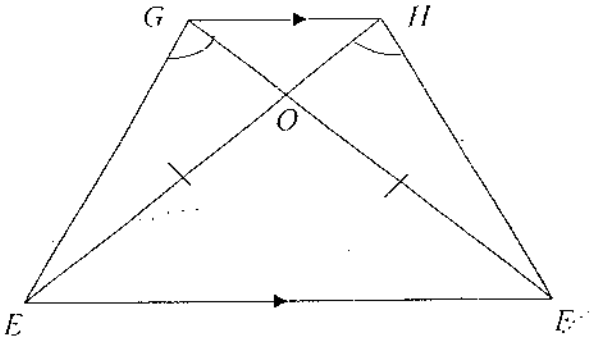
(a) Write down an expression for the time taken, in hours, for him to finish the race. [1]

(b) His competitor, Felipe Massa of Ferrari, completes the same race but at an average speed of 10 km/h less.
Write down an expression for the time taken, in hours, for Massa to finish the race. [1]

(c) Given that the difference between their time taken was three minutes, form an equation in x and show that it reduces to $x^2 - 10x - 60000 = 0$. [3]

(d) Solve the equation $x^2 - 10x - 60000 = 0$ by a formula method and hence find the time taken, in minutes, for Massa to finish the race. [4]

3



ΔOEF is isosceles in which $OE = OF$ and $\angle EGO = \angle FHO$.

(a) Prove that ΔGOE is congruent to ΔHOF. [3]

(b) **(i)** Name a pair of similar triangles. [1]

(ii) Given that $GH = 4$ cm, $FE = 12$ cm and $OF = 9$ cm, show that ΔFGE is isosceles. [3]

---

4 The equation of a straight line is $5y - 3x - 30 = 0$. It cuts the x-axis at P and the y-axis at Q.

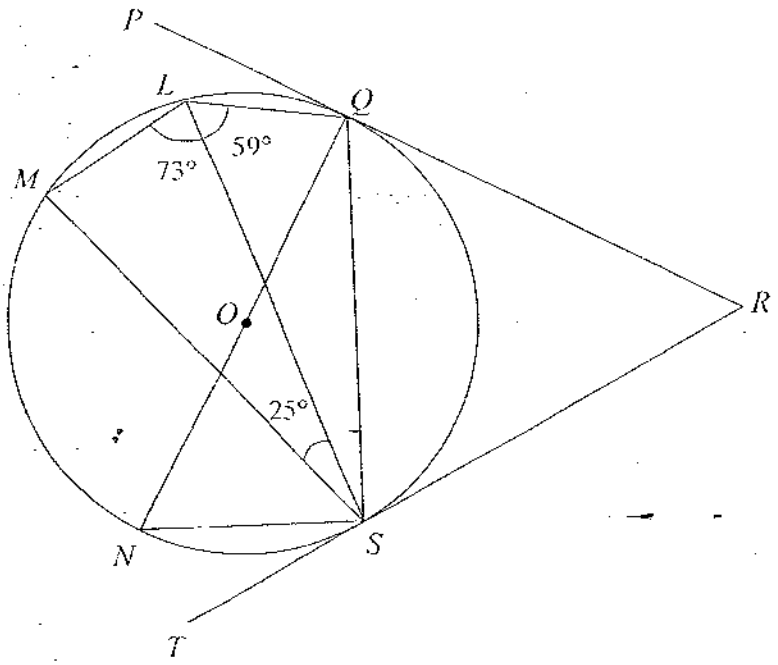
(a) **(i)** Find the coordinates of P and of Q. [3]

(ii) Show that the midpoint of PQ is $(-5, 3)$. [2]

(b) Given that R is the point $(1, -3)$, find

(i) the equation of the line ℓ through M and R, [3]

(ii) the coordinates of the point of intersection of the line ℓ and the line $2y = 3x + 1$. [3]



MON is the diameter of the circle with centre O.
PQR and TSR are tangents to the circle at Q and S respectively.

Given that $\angle LSM = 25°$, $\angle QLS = 59°$ and $\angle MLS = 73°$, find, with clearly stated reasons,

(a) (i) $\angle LOM$, [1]

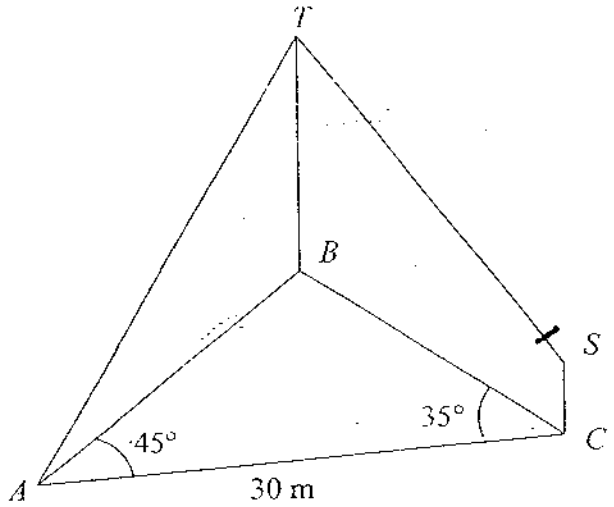
(ii) $\angle LSQ$, [1]

(iii) $\angle NQS$, [2]

(iv) $\angle QRS$. [2]

(b) If $QR = 7$ cm, find the area of ΔQRS. [2]

6



A, B and C are three points on horizontal ground.
$AC = 30$m, $\angle BAC = 45°$ and $\angle BCA = 35°$.
T is the top of the vertical Catholic High School clock tower and S is the top of a vertical statue standing at C. The angle of elevation of T from A is $58°$.

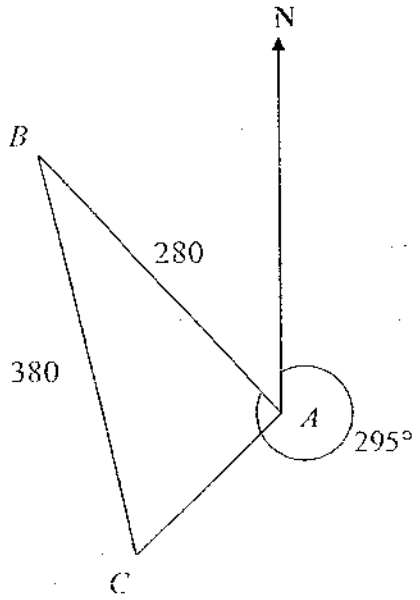
(a) Find

(i) the distance AB, [3]

(ii) the height of the clock fower. [2]

(b) If $BC = 21.5$m and the angle of depression of S from T is $49°$, find the height of the statue. [3]

7



Mr Lee walks from the point A on a bearing of 295° to a point B which is 280 m away. He then walks from B on a bearing of 172° towards a point C which is 380 m away.

Calculate

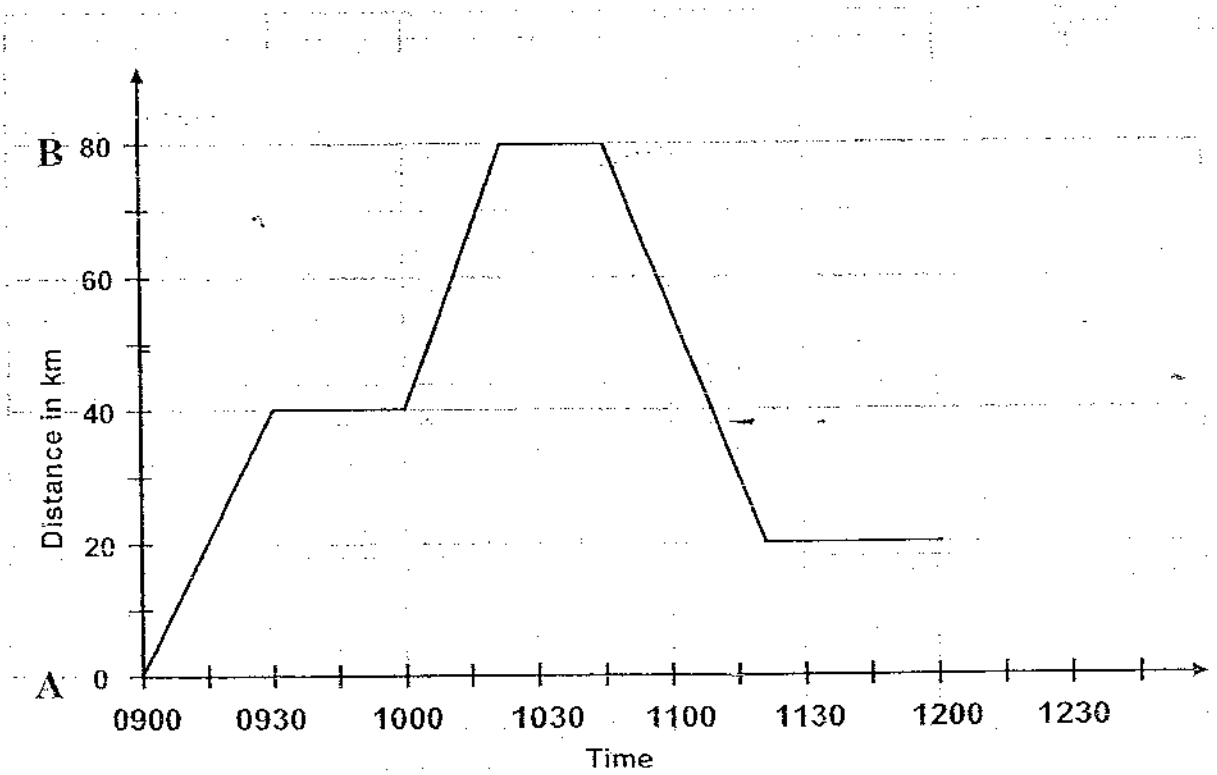
(a) $\angle ABC$, [3]

(b) the distance AC, [2]

(c) the shortest distance of A from BC, [2]

(d) the bearing of B from C. [1]

8 The diagram is a distance-time graph for the journey of a vehicle from point A to point B and its journey back to A during a period of $3\frac{1}{2}$ hours.



(a) Find the distance the vehicle had travelled by 09 45. [1]

(b) Give a brief description of what was happening to the vehicle between 09 30 and 10 00. [1]

(c) Calculate the speed that the vehicle must travel during the last part of its journey in order to return to its starting point by 12 30. [2]

(d) What is the average speed, in km/h, of the vehicle for the whole journey if it returns to the starting point at 12 30? [2]

(e) What is the acceleration at 11 00? [2]

(f) A second vehicle leaves B for A at 10 00. It travelled at a constant speed of 80 km/h. By adding a straight line on the graph, state an estimate of the time at which the two vehicles first met, giving your answers to the nearest minute. [1]

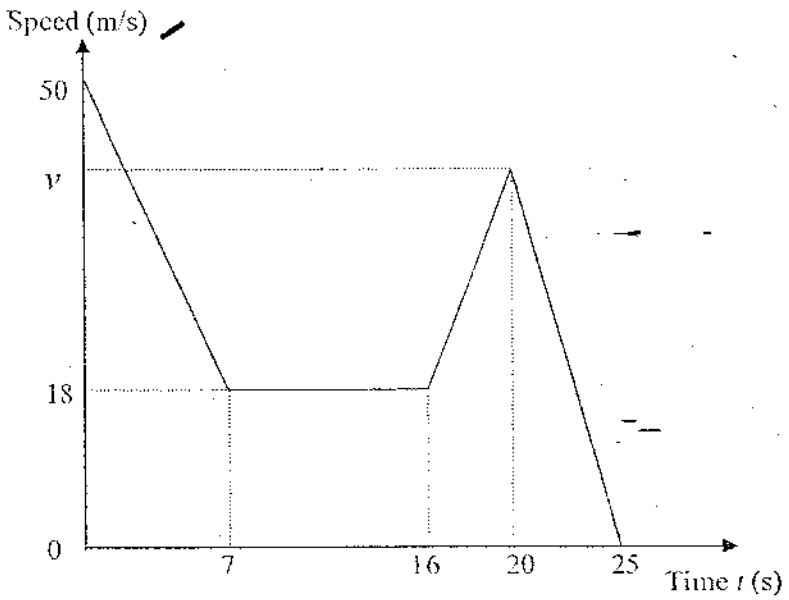
The diagram shows the speed-time graph for the first 25 seconds of the motion of a particle.

(a) Calculate the speed when $t = 3$. [2]

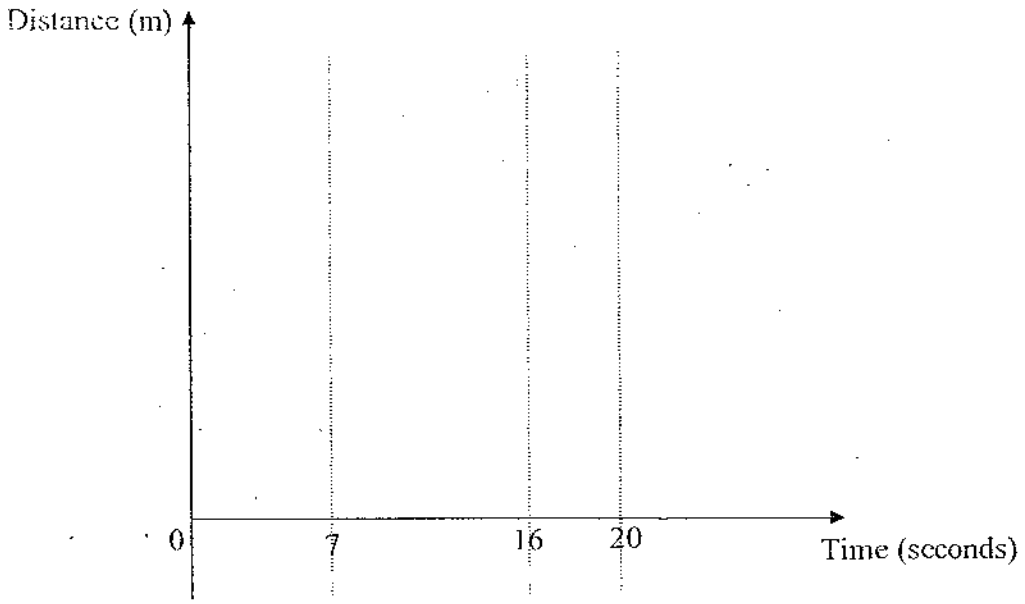
(b) Calculate the acceleration of the particle when $t = 18$. [2]

(c) Calculate the distance travelled in the first 16 seconds of the motion. [2]

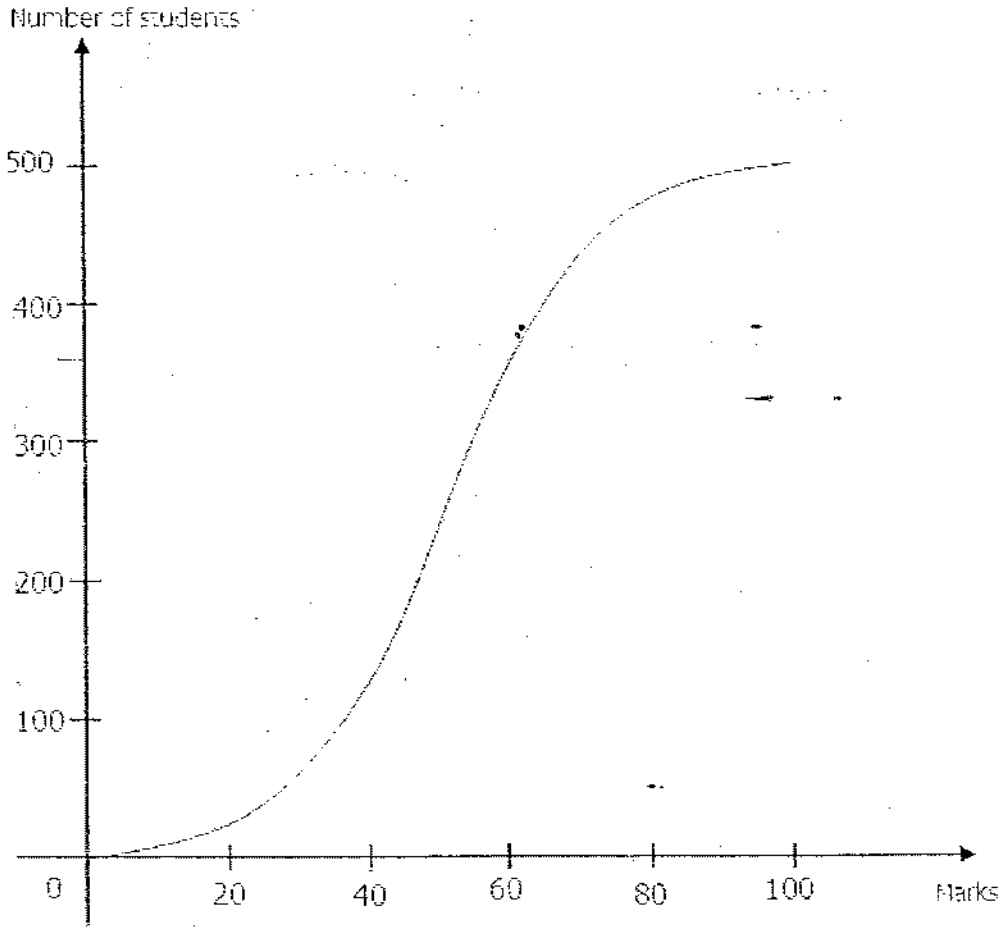
(d) Find the value of v if the deceleration of the particle in the last 5 seconds is 8 m/s^2. [2]



(e) Copy the axes below and sketch the distance time graph of the object during the first 20 seconds of the motion. [3]



10 The marks scored by a group of 500 students in a Mathematics test are shown in the cumulative frequency curve below.



Use the graph to estimate the

(a) **(i)** median mark, [1]

(ii) interquartile range, [2]

(iii) 94^{th} percentile, [1]

(iv) passing mark, if 65% of the students passed the test, [1]

(v) number of students who scored a distinction, if a students needs to score above 82 marks to obtain a distinction. [1]

(b) Given that the highest mark obtained is 100 and the lowest mark obtained is 0, draw a box-and-whiskers plot. [3]

11 **Answer the whole of this question on a sheet of graph paper.**

The variables x and y are connected by the equation $y = 3x - 2x^2$.

(a) Copy and complete the following table: [2]

x	-2	-1.5	-1	0	1	2	2.5	3
y	-14	...		0	1	-2		

(b) Using 2 cm to represent 1 unit on the x-axis and 1 cm to represent 1 unit on the y-axis, draw the graph of $y = 3x - 2x^2$ for $-2 \leq x \leq 3$. [3]

(c) From your graph,

(i) find the value of y when x is -1.2, [1]

(ii) find the values of x when y is -2.5. [1]

(d) By drawing a tangent, find the gradient of the graph when $x = 1.5$. [2]

(e) By drawing another line on the graph, find the solution of the equation

$$1 + 2x - 2x^2 = 0.$$ [3]

The End

SOLUTIONS

1. (a) (i) $4p^2 - 36 = 4(p^2 - 9)$ M1
$= 4(p+3)(p-3)$ A1

(ii) $\frac{4p^2 - 36}{5p^2 + 8p - 21} = \frac{4(p+3)(p-3)}{(5p-7)(p+3)}$ M1
$= \frac{4(p-3)}{5p-7}$ A1

(b) $(x-2)(2x+3) - 2(x+1)^2 = 2x^2 - x - 6 - 2(x^2 + 2x + 1)$ M1
$= -5x - 8$ or $-(5x+9)$ A1

(c) $\frac{1}{a} = \frac{1}{b} - \frac{1}{c}$

$\frac{1}{c} = \frac{1}{b} - \frac{1}{a}$

$= \frac{a-b}{ab}$ M1

$\therefore c = \frac{ab}{a-b}$ A1

Time taken (Alonso) $= \frac{300}{x}$ h B1

Time Taken (Massa) $= \frac{300}{x-10}$ h B1

$\frac{300}{x-10} - \frac{300}{x} = \frac{1}{20}$ M1

$6000x - 6000x + 60000 = x(x-10)$ M1

$x^2 - 10x - 60000 = 0$ A1

$x = \frac{10 \pm \sqrt{100 - 4(1)(-60000)}}{2(1)}$ M1

$= \frac{10 \pm \sqrt{240100}}{2}$

$\frac{10+490}{2}$ or $\frac{10-490}{2}$ (N.A.) A1

250

time taken (Massa) $= \frac{300}{250-10}$ M1

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

$= 75$ min A1

3. (a) $\angle EGO = \angle FHO$ (given)

$OE = OF$ (isos. Δ) M1

$\angle GOE = \angle HOF$ (vert. opp. $\angle$s) M1

$\therefore \Delta GOE \equiv \Delta HOF$ (AAS) A1

(b) (i) ΔEOF and ΔHOG B1

(other variations but corresponding)

(ii) $\frac{GO}{FO} = \frac{GH}{FE}$

$\frac{GO}{9} = \frac{4}{12}$

$\therefore GO = \frac{4}{12} \times 9 = 3$ M1

$GF = GO + OF = 3 + 9 = 12$ cm A1

Since $GF = EF = 12$ cm, ΔFGE is isosceles. (shown) M1

4. (a) (i) Let P = (p, 0) and Q = (0, q)

sub. x = p, y = 0 into equation

$-3p - 30 = 0$

$-3p = 30$

$p = -10$

sub x = 0, y = q into equation M1

$5q - 30 = 0$

$5q = 30$

$q = 6$

$\therefore P = (-10,0)$ and $Q = (0,6)$ A2

(ii) $M = \left(\frac{-10+0}{2}, \frac{0+6}{2}\right)$ M1

$= (-5,3)$ A1

(b) (i) gradient of $\ell = \frac{-3-3}{1+5}$

$= \frac{-6}{6}$

$= -1$ M1

sub. $m = -1, x = 1, y = -3$ into $y = mx + c$

$-3 = -(1) + c$

$c = -2$ M1

$\therefore$ equation of ℓ : $y = -x - 2$ A1

(ii) $y = -x - 2$ – (1)

$2y = 3x + 1$ – (2)

sub. (1) into (2) M1

$2(-x - 2) = 3x + 1$

$-2x - 4 = 3x + 1$

$5x = -5$

$x = -1$

sub. $x = 1$ into (1) $y = -(-1) - 2 = -1$

$\therefore$ point of intersection $= (-1,-1)$ A2

5. (a) (i) $\angle LOM = 2(25°)$ ($\angle$ at centre $= 2\angle$ at circumference)
$= 50°$ A1

(ii) $\angle LSQ = 180° - 73° - 59° - 25°$ (opp. $\angle$s of cyc. quad)
$= 23°$ A1

(iii) $\angle QNS = 59°$ ($\angle$s in the same segment)
$\angle NSQ = 90°$ (rt. $\angle$ in semicircle) M1

$\therefore \angle NQS = 180° - 90° - 59°$ ($\angle$s in a Δ)
$= 31°$ A1

(iv) $\angle OQR = 90°$ (tan $\perp$ rad) M1
$\therefore SQR = 90° - 31°$
$= 59°$ A1
OR
$\angle SQR = 59°$ ($\angle$s in alt. segment)
$\angle SQR = \angle QSR = 59°$ (tan. from ext. point equal) M1
$\therefore \angle QRS = 180° - 59° - 59°$ ($\angle$s in a Δ)
$= 62°$ A1

(b) Area of $\Delta QRS = \frac{1}{2}(7)(7)\sin 62°$ M1
$= 21.6\,cm^2$ A1

(i) $\angle ABC = 180° - 45° - 35°$ ($\angle$s in a Δ)

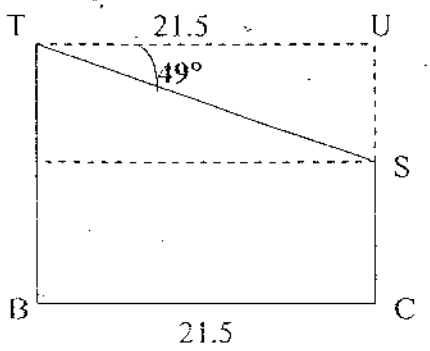
$= 100°$ A1

$\frac{AB}{\sin 35°} = \frac{30}{\sin 100°}$ M1

$\therefore AB = 17.5\,\text{m}$ (3 s.f.) A1 [17.4727]

(ii) $\tan 58° = \frac{BT}{17.4727}$ M1

$\therefore BT = 28.0$ m (3 s.f.) A1 [27.9622]



$\tan 49° = \frac{US}{21.5}$ M1

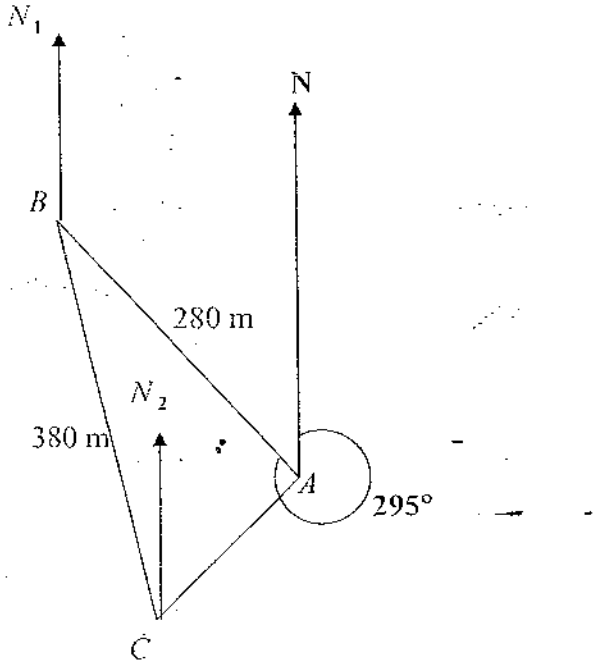
$US = 24.7329\text{m}$ A1

$\therefore$ height of statue $= BT - US$

$= 27.9622 - 24.7329$

$= 3.23\,\text{m}$ (3 s.f.) A1

7. (a)



$\angle NAB = 360° - 295°$
$= 65°$ M1

$\angle N_1BA = 180° - 65°$ (int. $\angle$s)
$= 115°$ M1

$\therefore \angle ABC = 172° - 115°$
$= 57°$ A1

(b) $AC^2 = 380^2 + 280^2 - 2(380)(280)\cos 57°$
$= 106900.8133$ M1

$\therefore AC = 327$ m (nearest metre) A1 [326.9569]

(c) $\angle N_2CB = 180° - 172°$ (int. $\angle$s)
$= 8°$ M1

$\therefore$ bearing of B from C $= 360° - 8°$ ($\angle$s at a point)
$= 352°$ A1

(a) Distance travelled by 09 45 = **40** km A1

(b) The vehicle was at rest/stationary. A1

(c) Distance to travel = 20 km

Time left to complete journey = $\frac{1}{2}$ **h**.

speed it must travel at = $\frac{\mathbf{20}}{\mathbf{0.5}}$ M1

= **40** km/h A1

(d) Total distance = 2(80) = 160 km
Total time = 3.5 h

average speed = $\frac{\textbf{totaldistance}}{\textbf{totaltime}}$

= $\frac{160}{3.5}$ M1

= $45\frac{5}{7}$ km/h or 45.7 km/h (3 s.f.) A1

(e) Speed at 11 00h = $\frac{\textbf{changeindistance}}{\textbf{changeintime}}$ M1

= $\frac{\mathbf{60}}{\mathbf{36}}$

$\mathbf{60}$

= **100** km/h A1

(f) From graph, the time is 10 12 h. A1

9. (a) Let the speed be s

$$\frac{50-s}{3} = \frac{50-18}{7} \qquad \text{M1}$$

$$50 - s = \frac{32}{7}(3)$$

$$\therefore s = 50 - \frac{96}{7}$$

$$= 36\frac{2}{7} \text{ km/h or } 36.3 \text{ km/h (3 s.f.)} \qquad \text{A1}$$

(b)

(c) Distance travelled $= \frac{1}{2}(50+18)(7) + (16-7)(18)$ M1

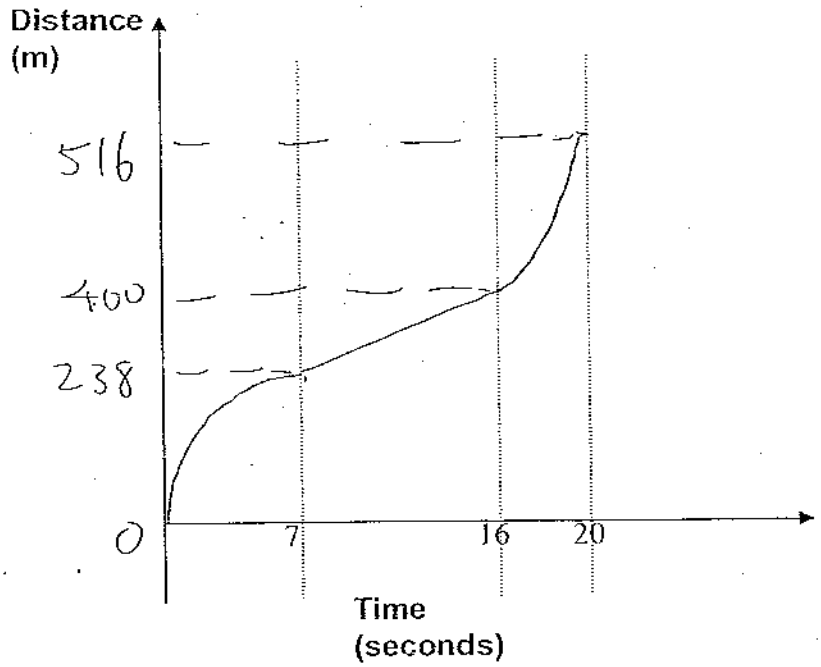
$= 400$ m A1

(d) $\frac{v-0}{25-20} = 8$ M1

$\therefore v = 8(5)$

$= 40$ m/s A1

(e)



(b) (i) Median = 51 marks A1

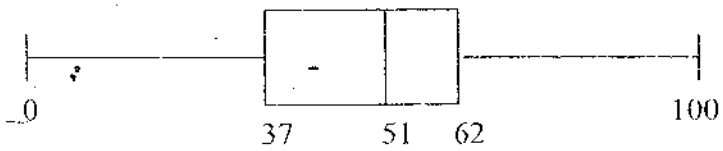
(ii) Interquartile range = 62 – 37 M1
= 25 marks A1

(iii) 94th percentile = 78 marks A1

(c) The passing mark is 58 marks. A1

(d) The number of students = 20 A1

(e)



M1
A2