Trinity Grammar School

Mathematics Department

2015
YEARLY EXAMINATION

PRELIMINARY ASSESSMENT TASK 4

Year 11

Mathematics

General Instructions

- Reading time – 5 minutes
- Working time – 2.5 hours
- Write using black or blue pen
- Only approved calculators for this course are allowed in this task
- Show all necessary working
- Write your Board of Studies Student Number (Year 12 HSC) or Name (Year 11) and your Class teacher on the question paper and on any answer sheets or writing booklets used to write your responses to the questions submitted
- If you do not attempt a question you must submit an answer sheet or writing booklet for that question clearly indicating **N/A** and your Student Number or Name.

- **Preliminary Assessment Weighting:** 40%

Board of Studies Student Number (Year 12 only)

Class Teacher:

.....

Name:
(Year 11 only)

.....

Do NOT write solutions on this question paper. Any working on this question paper will NOT be marked.

Date of examination:

Monday, 24 August 2015

Total marks – 100

Section I

10 marks

- Attempt all Questions
- Allow about **15** minutes for this section

Section II

90 marks

- Attempt all Questions
- Allow about **2** hours **15** minutes for this section

Section I 10 marks

- Attempt Questions 1 – 10
- Allow about 15 minutes for this section
- Shade the correct response on the multiple-choice answer sheet for Questions 1 – 10
- Each question is worth 1 mark

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1. If $f(x) = 2x^2 - 5$ find $f(-4)$

(A) -32

(B) 59

(C) -69

(D) 27

2. Simplify $2-(3-2x)$

(A) $-1+2x$

(B) $-1-2x$

(C) $1+2x$

(D) $-2+2x$

3. If $\sin^2\theta = \frac{1}{4}$ where $0 \le \theta \le 360^\circ$, then $\theta =$

(A) $30^\circ, 150^\circ$

(B) $30^\circ, 150^\circ$

(C) $60^\circ, 120^\circ, 240^\circ, 300^\circ$

(D) $30^\circ, 150^\circ, 210^\circ, 330^\circ$

4. Find $\frac{dy}{dx}$ if $y = -3x^{-5}$

(A) $-3x^{-6}$

(B) $\frac{15}{x^6}$

(C) $-15x^{-4}$

(D) $15x^{-5}$

5. Which expression is a factorisation of $9a^3 - ab^2$

(A) $a(3a+b)(3a-b)$

(B) $a(3a-b)^2$

(C) $9a(a-b)^2$

(D) $a(3a-b)(9a^2+3ab+b^2)$

6. A is the point (-4, 9) and B is the point (x, y).

The midpoint of AB is $(1, 6)$. The coordinates of B are

(A) $(6, 3)$

(B) $(6, 2)$

(C) $(3, 3)$

(D) $(4, 3)$

7. Which statement is **false** for the line $2x - 3y - 6 = 0$?

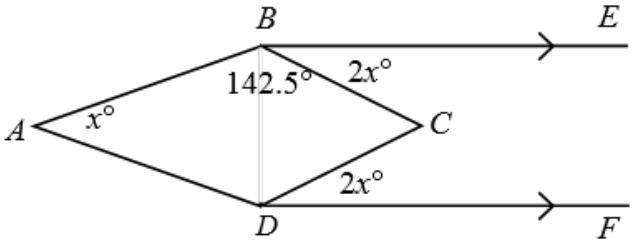
(A) The y intercept is -2

(B) Gradient is $\frac{2}{3}$

(C) Angle of inclination with the x axis is $33^\circ 41'$

(D) It is perpendicular to $2x + 3y - 6 = 0$

8. The diagram shows the kite *ABCD* and parallel lines *BE* and *DF*.
$\angle ABC = 142.5°$, $\angle BAD = x°$, $\angle CBE = \angle CDF = 2x°$



NOT TO SCALE

What is the value of x?

(A) 15

(B) 37.5

(C) 45

(D) 75

9. Evaluate: $\lim_{x \to 3} \left(\frac{x^2 - 9}{x - 3} \right)$

(A) 0

(B) 3

(C) 4

(D) 6

10. $\left(x + y^{-1}\right)^{-1} =$

(A) $\frac{y}{x+1}$

(B) $\frac{x}{xy+1}$

(C) $\frac{y}{xy+1}$

(D) $\frac{y}{y+1}$

End of Section I

Section II commences on the next page

Section II 90 marks

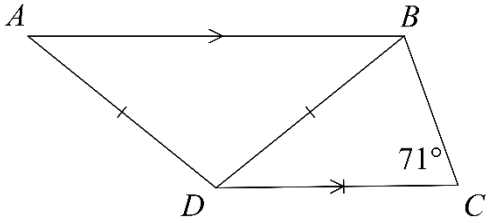
- Attempt Questions 11 – 16
- Allow about 2 hours and 15 minutes for this section
- Answer each question in a SEPARATE writing booklet or answer sheet. Extra writing booklets are available.
- In Questions 11 – 16, your responses should include all relevant mathematical reasoning and/or calculations.

Question 11 (15 marks) Use a SEPARATE writing booklet **Marks**

(a) Find the value of a and b if $\dfrac{4}{3-\sqrt{7}} = a + b\sqrt{7}$. **2**

(b) Expand and simplify: $(5a+2b)(3a-4b)$. **1**

(c) In the diagram below, $AB \parallel CD$, $AD = BD = CD$ and $\angle BCD = 71^\circ$.



Not to scale

(i) Find the size of $\angle BDC$. Give reasons. **2**

(ii) Find the size of $\angle ADC$. Give reasons. **2**

(d) Factorise completely $x^2y - y - x^2z + z$. **2**

(e) Solve $|4-3x| < 7$. **2**

(f) Solve :

(i) $2x - 6 = 5x - 4$ **1**

(ii) $\dfrac{7x}{5} - \dfrac{x}{2} = 9$ **1**

(g) State the domain and range of the function $f(x) = \sqrt{4-x^2}$. **2**

End of Question 11

Question 12 (15 marks) Use a SEPARATE writing booklet **Marks**

(a) The fuel tank on my new car was 40% full. I added 28 litres and then found it was 75% full. How much fuel does the tank hold? **1**

(b) Evaluate $\sqrt{\dfrac{6.749 \times (3.22)^2}{17.413}}$ correct to 3 significant figures. **2**

(c) Solve $\dfrac{3x-2}{5} = \dfrac{x}{4} + 3$. **2**

(d) Find the exact value of $t^3 - 2t^2 + 2t + 1$ when $t = 2\sqrt{3}$. **2**

(e) Express $\dfrac{x+1}{x^2-x} - \dfrac{x-1}{x^2+x}$ as a single fraction in its lowest form. **3**

(f) Shade the region represented by $9 < x^2 + y^2 \leq 25$ on a number plane. **3**

(g) Differentiate: $y = \sqrt{4x-5}$. **2**

Give your answer without negative or fractional indices.

End of Question 12

Question 13 (15 marks) Use a SEPARATE writing booklet **Marks**

(a) Find the exact value of $\cot(-135°)$. **2**

(b) State the range of $y = 1 - 2x^2$. **1**

(c) Prove that $\dfrac{1}{\sin^2\theta} + \dfrac{1}{\cos^2\theta} = \sec^2\theta \operatorname{cosec}^2\theta$. **3**

(d) Two ships sail from the town of Posthawk (P). The ship Longview (L) sails on a bearing of 118° and the ship Quest (Q) on a bearing of 276°. Both ships sailed for 3 hours, the Longview at a speed of 8 knots and the Quest at a speed of 12 knots.

(1 knot = 1 nautical mile per hour)

(i) Draw a diagram to show and the distance and direction of the two ships from P after 3 hours. **1**

(ii) Find the distance, in nautical miles, between the 2 ships after 3 hours. **2**

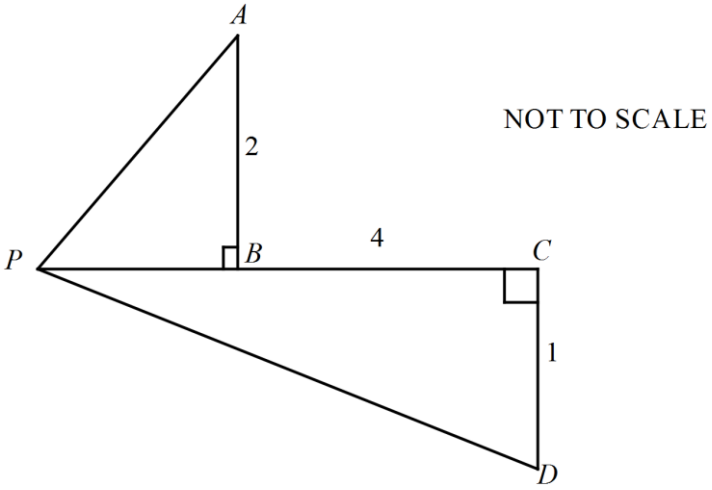
(Answer correct to 1 decimal place)

(iii) Find the bearing of the Quest from the Longview after 3 hours. **2**

(Answer to the nearest degree)

(e) In the diagram $AB = 2$, $BC = 4$ and $CD = 1$. **4**

If $PD^2 = 2PA^2$, find PB.



End of Question 13

Question 14 (15 marks) Use a SEPARATE writing booklet **Marks**

(a) Differentiate each of the following expressions.

(i) $(3x-1)^4$ **1**

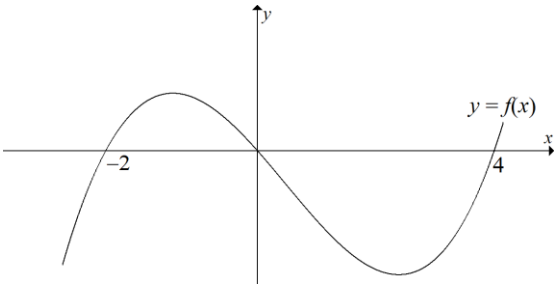
(ii) $3x^2(3x^4-x)$ **2**

(iii) $\dfrac{2x-3}{3x-2}$. **2**

(b) Determine, with working, if the function $f(x)=x^3+1$ is odd, even or neither. **2**

(c) Given the function $f(x)=\dfrac{x^4}{4}-x$, solve the equation $f'(x)=7$. **2**

(d) For $y=f(x)$ below, state the values of x for which $f(x)\le 0$. **2**



(e) (i) Factorise x^2+3x+2. **1**

(ii) Sketch the function $y=x^2+3x+2$. **1**

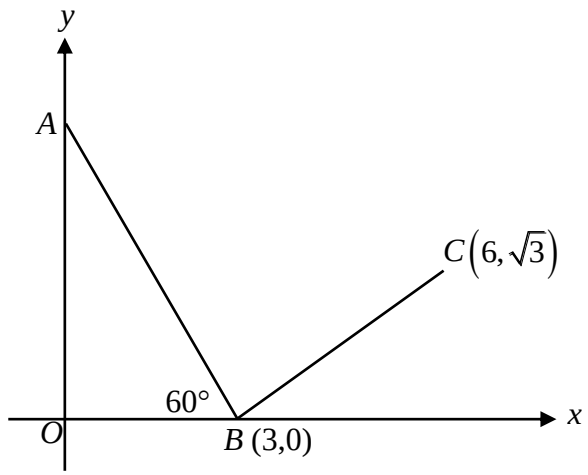
(iii) State the axis of symmetry and the vertex. **2**

End of Question 14

Question 15 (15 marks) Use a SEPARATE writing booklet **Marks**

(a) The diagram shows the points $B(3,0)$ and $C\left(6,\sqrt{3}\right)$.

A is the point on the y-axis such that $\angle ABO = 60°$.



NOT TO SCALE

(i) Show that the equation of the line AB is $y = -\sqrt{3}x + 3\sqrt{3}$. **2**

(ii) Show the coordinates of the point A are $\left(0, 3\sqrt{3}\right)$. **1**

(iii) Show that the lines AB and BC are perpendicular. **2**

(iv) Find the length of AC. **2**

(v) The point D is chosen so that the quadrilateral $ABCD$ is a rectangle. State the coordinates of the point D. **2**

(vi) Find the mid-point of A and C. **2**

(b) Given that $\cot\theta = 1$ and $-180° \le \theta \le 0°$, find the exact value of $\sin\theta$. **2**

(c) Simplify : $\sqrt{\cos^2(90 - \theta) \div \cos^2\theta}$ **2**

End of Question 15

Question 16 (15 marks) Use a SEPARATE writing booklet **Marks**

(a) Find the value of x if $2^x \times 4^{x+1} = 0.5$. **2**

(b) Given $f'(x) = \lim_{h \to 0} \dfrac{f(x+h) - f(x)}{h}$, differentiate from first principles $f(x) = x^2$. **3**

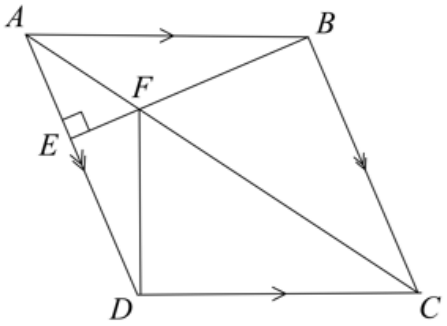
(c) The function $y = f(x)$ is defined as follows: **2**

$$f(x) = \begin{cases} 2^x & for\ x < 0 \\ 1 & for\ x = 0 \\ x^{-1} & for\ x > 0 \end{cases}$$

Evaluate: $f(-3) + f(0) + f(3)$.

(d) Find the equation of the normal to the curve $y = x^2 - 5x + 6$ at $(1, 2)$. **3**

(e) $ABCD$ is a rhombus, BE is perpendicular to AD and intersects AC at F.



Not to scale

(i) Explain why $\angle BCA = \angle DCA$. **1**

(ii) Prove that $\Delta BFC \equiv \Delta DFC$. **3**

(iii) Show that $\angle CBF$ is a right angle. **1**

End of Question 16

End of Section II

End of Yearly Examination

KARA KIOZIS

please mark question 14

SOLUTIONS

SECTION I

Multiple Choice

1 D 2 A 3 D 4 B 5 A 6 A 7 D 8 A 9D 10 C

1. $f(-4)=2\times(-4)^2-5=32-5=27$

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

3. $sin^2\theta=\frac{1}{4}\rightarrow sin\theta=\frac{\pm1}{2}\rightarrow\theta=30^0,150^0,210,330^0$

4 $y=-3x^{-5}\therefore\frac{dy}{dx}=15x^{-6}=\frac{15}{x^6}$

5 $9a^3-ab^2=a(9a^2-b^2)=a(3a+b)(3a-b)$

6. $\frac{-4+x}{2}=1\rightarrow x=6,\frac{9+y}{2}=6\rightarrow y=3\therefore(6,3)$

7 $2x-3y-6=0$, $y=\frac{2}{3}x-2$, y-intercept is -2, $m=\tan\theta=\frac{2}{3}$, $\therefore\theta=33°41'$

8 $\angle BCD=2x°+2x°=4x°$

$x+4x+142.5+142.5=360$
$5x+285=360$
$5x=360-285$
$=75$
$x=75\div5=15$

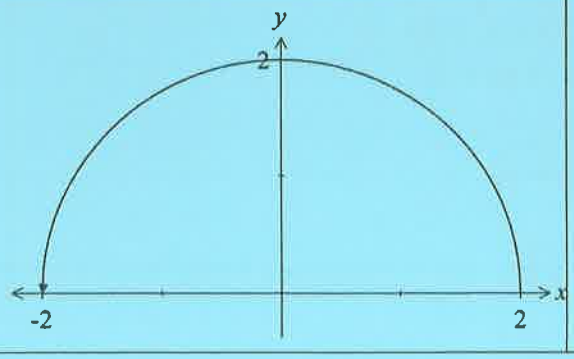
9. $\lim_{x\rightarrow3}3\left(\frac{x^2-9}{x-3}\right)=\lim_{x\rightarrow3}3\frac{(x-3)(x+3)}{x-3}=\lim_{x\rightarrow3}3(x+3)=6$

10. $\left(x+y^{-1}\right)^{-1}=\frac{1}{\left(x+\frac{1}{y}\right)}=\frac{1}{\frac{xy+1}{y}}=\frac{y}{xy+1}$

SECTION II

Question 11

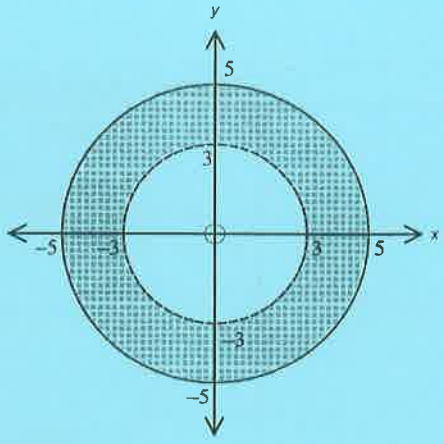
11(a)	$\frac{4}{3-\sqrt{7}}=\frac{4}{3-\sqrt{7}}\times\frac{3+\sqrt{7}}{3+\sqrt{7}}=\frac{4(3+\sqrt{7})}{9-7}=6+2\sqrt{7}$ $\therefore a=6$ and $b=2$	2 Marks: Correct answer. 1 Mark: Uses the conjugate.
11(b)	$(5a+2b)(3a-4b)=15a^2-20ab+6ab-8b^2$ $=15a^2-14ab-8b^2$	1 Mark: Correct answer.
11(c) (i)	ΔBDC is an isosceles triangle (two equal sides, $BD=CD$) $\angle CBD=\angle BCD=71^\circ$ (base angles equal, isosceles triangle) $\angle BDC+\angle CBD+\angle BCD=180^\circ$ (Angle sum of a triangle 180°) $\angle BDC+71^\circ+71^\circ=180^\circ$ $\angle BDC=38^\circ$	2 Marks: Correct answer. 1 Mark: Finds 38° without appropriate reasons.
11(c) (ii)	$\angle BDC=\angle ABD=38^\circ$ (alternate angles are equal, $AB \square CD$) ΔABD is an isosceles triangle (two equal sides, $AD=BD$) $\angle ABD=\angle BAD=38^\circ$ (base angles equal, isosceles triangle) In ΔABD $\angle ADB+\angle ABD+\angle BAD=180^\circ$ (Angle sum of a triangle 180°) $\angle ADB+38^\circ+38^\circ=180^\circ$ $\angle ADB=104^\circ$ $\angle ADC=\angle ADB+\angle BDC$ $=104^\circ+38^\circ=142^\circ$	2 Marks: Correct answer. 1 Mark: Finds 142° without appropriate reasons or shows some understanding.

11(d)	$x^2y-y-x^2z+z=y(x^2-1)-z(x^2-1)$ $=(x^2-1)(y-z)$ $=(x+1)(x-1)(y-z)$	2 Marks: Correct answer. 1 Mark: Only partly factorised.
11(e)	$4-3x<7$ and $-(4-3x)<7$ $-3x<3$ $-4+3x<7$ $x>-1$ $3x<11$ $x<\frac{11}{3}$ or $3\frac{2}{3}$ Solution is $-1<x<\frac{11}{3}$	2 Marks: Correct answer. 1 Mark: Finds one solution or shows some understanding.
11(f) (i)	$2x-6=5x-4$ $-3x=2$ $x=-\frac{2}{3}$	1 Mark: Correct answer.
11(f) (ii)	$\frac{7x}{5}-\frac{x}{2}=9$ $\frac{14x}{10}-\frac{5x}{10}=9$ $\frac{9x}{10}=9$ $x=\frac{90}{9}=10$	1 Mark: Correct answer.
11(g)	Domain: $-2\le x\le 2$, Range: $0\le y\le 2$ 	2 Marks: Correct answer. 1 Mark: Domain **or** range correct.

SECTION II

Question 12

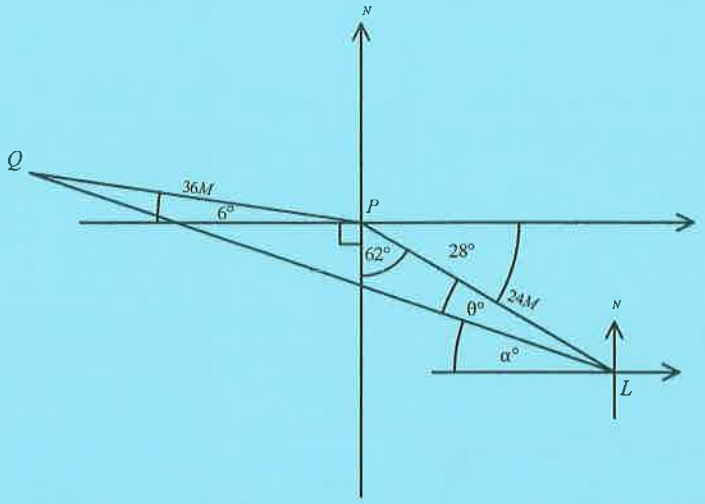
	Solution	Marks	Allocation of marks
(a)	$35\% = 28L$ $1\% = 0.8$ $100\% = 80L$	1	1-answer correct.
(b)	2.00465 2.00	2	1- answer 1- correct rounding
(c)	$20 \times \frac{3x-2}{5} = 20 \times \frac{x}{4} + 3 \times 20$ $4(3x-2) = 5x + 60$ $12x - 8 = 5x + 60$ $7x = 68$ $x = 9\frac{5}{7}$	2	1- removal of denominator (or alternate method) 1- for answer
(d)	$(2\sqrt{3})^3 - 2(2\sqrt{3})^2 + 2(2\sqrt{3}) + 1$ $= 8 \times 3\sqrt{3} - 2 \times 4 \times 3 + 4\sqrt{3} + 1$ $= 24\sqrt{3} - 24 + 4\sqrt{3} + 1$ $= 28\sqrt{3} - 23$	2	1- correct expansion 1- answer
(e)	$\frac{x+1}{x(x-1)} - \frac{x-1}{x(x+1)}$ $= \frac{(x+1)^2 - (x-1)^2}{x(x-1)(x+1)}$ $= \frac{x^2 + 2x + 1 - (x^2 - 2x + 1)}{x(x-1)(x+1)}$ $= \frac{x^2 + 2x + 1 - x^2 + 2x - 1}{x(x-1)(x+1)}$ $= \frac{4x}{x(x-1)(x+1)}$ $= \frac{4}{(x-1)(x+1)}$	3	1- common denominator 1- correct expansion 1- simplified answer

	Solution	Marks	Allocation of marks
(f)		3	1- Correct circles 2- Correct solid and dotted lines. 3- Correct shading
(g)	$y = (4x-5)^{\frac{1}{2}}$, $y' = \frac{1}{2}(4x-5)^{-\frac{1}{2}} \times 4$ $= 2(4x-5)^{-\frac{1}{2}}$ $= \frac{2}{\sqrt{4x-5}}$	2	1-correct use of chain rule 1-correct final answer.
		/15	

SECTION II

Question 13.

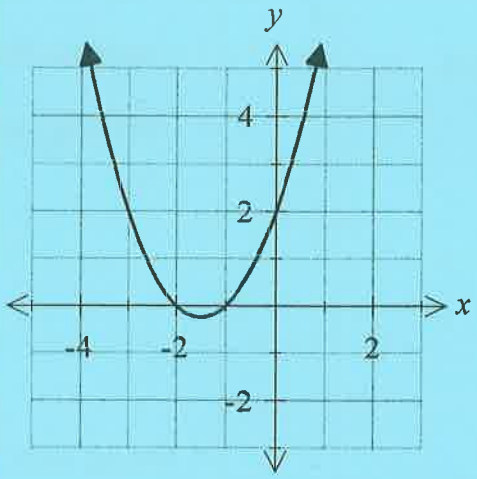
	Solution	Marks	Allocation of marks
(a)	$\cot(-135^\circ) = \cot 225^\circ$ $= \cot 45^\circ$ $= 1$	2	1-cot45 2-correct answer of 1
(b)	$y \leq 1$	1	
(c)	$LHS = \dfrac{1}{\sin^2\theta} + \dfrac{1}{\cos^2\theta}$ $= \dfrac{\cos^2\theta + \sin^2\theta}{\sin^2\theta \cos^2\theta}$ $= \dfrac{1}{\sin^2\theta \cos^2\theta}$ $= \dfrac{1}{\sin^2\theta} \times \dfrac{1}{\cos^2\theta}$ $= \text{cosec}^2\theta \sec^2\theta$ $= RHS$	3	1- common denominator 1- simplification 1- separate fractions to achieve result.

	Solution	Marks	Allocation of marks
(d)	(i) L travels at 8 M /h for 3 hours so $LP = 3 \times 8 = 24$ M Q travels at 12 M /h for 3 hours so $QP = 3 \times 12 = 36$ M  	1	1- diagram
	ii) $\angle QPL = 90° + 62° + 6° = 158°$ $LQ^2 = 36^2 + 24^2 - 2 \times 36 \times 24 \times \cos 158°$ $= 3474.17$ $LQ = 58.9M$	2	1- distance
	iii) $\frac{\sin\theta}{36} = \frac{\sin 158°}{58.9}$ $\sin\theta = \frac{36\sin 158°}{58.9}$ $= 0.229$ $\theta = 13°$ (nearest degree) $\alpha = 28° - 13°$ $= 15°$ Bearing $= 270° + 15°$ $= 285°$	2	1- for θ. 1- for bearing
(e)	$PA^2 = PB^2 + 4$ $PD^2 = (PB + 4)^2 + 1^2$ *since* $PD^2 = 2PA^2$ $2PA^2 = PB^2 + 8PB + 16 + 1$ $2(PB^2 + 4) = PB^2 + 8PB + 17$ $2PB^2 + 8 = PB^2 + 8PB + 17$ $PB^2 - 8PB - 9 = 0$ $(PB - 9)(PB + 1) = 0$ $PB = 9$ $PB = -1$ *solution:* $PB = 9$	4	1- use of Pythagoras to find PA^2 and PD^2 1- correct substitutions 1- solving quadratic 1- correct solution

SECTION II

Question 14

(a)	(i) $\frac{d}{dx}(3x-1)^4 = 4(3x-1)^3 \times 3$ $= 12(3x-1)^3$	1	
	(ii) $u = 3x^2 \qquad v = 3x^4 - x$ $u' = 6x \qquad v' = 12x^3 - 1$ $\frac{d}{dx}\left[3x^2(3x^4-x)\right] = (3x^2)(12x^3-1) + (3x^4-x)6x$ $= 36x^5 - 3x^2 + 18x^5 - 6x^2$ $= 54x^5 - 9x^2$	2	
	Simpler (better) method $\frac{d}{dx}\left(3x^2(3x^4-x)\right) = \frac{d}{dx}\left(9x^6 - 3x^3\right)$ $= 54x^5 - 9x^2$	2	
	(iii) $\frac{d}{dx}\left(\frac{2x-3}{3x-2}\right) = \frac{(3x-2)\times 2 - (2x-3)\times 3}{(3x-2)^2}$ $= \frac{6x-4-6x+9}{(3x-2)^2} = \frac{5}{(3x-2)^2}$		
(b)	$f(x) = x^3 + 1$ $f(-x) = (-x)^3 + 1 = -x^3 + 1$ $-f(x) = -(x^3+1) = -x^3 - 1$ $f(x) \neq f(-x) \neq -f(x)$ $\therefore$ not odd or even	2	
(c)	$f'(x) = 4\left(\frac{x^3}{4}\right) - 1 = x^3 - 1$ $7 = x^3 - 1$ $8 = x^3$ $x = 2$	2	
(d)	$x \leq -2$ and $0 \leq x \leq 4$	2	1 mark for each

(e)	(i) $x^2 + 3x + 2 = (x + 2)(x + 1)$	1	1 mark
	(ii) 	1	1 mark if both x intercepts and y intercept shown.
	(iii) axis of symmetry : $x = -\frac{3}{2} = -1\frac{1}{2} = -1.5$ If $x = -1.5$ then $y = (-1.5)^2 + 3(-1.5) + 2 = -0.25$ Vertex = (-1.5, -0.25)	2	1 mark for axis of symmetry 1 mark for vertex

SECTION II

Question 15

(a)	(i) $m = -\tan(60)° = -\sqrt{3}$ Substitute (3,0) into the equation of a line formula $y - 0 = -\sqrt{3}(x - 3)$ $y = -\sqrt{3}x + 3\sqrt{3}$	2	1 – showing gradient 1 – showing substitution
	(ii) sub x=0 into the equation of AB. $y = -\sqrt{3} \times 0 + 3\sqrt{3}$ $y = 3\sqrt{3}$ $\therefore A = (0\ \ 3\sqrt{3})$	1	
	(iii) $m(AB) = -\sqrt{3}$ $m(BC) = \frac{\sqrt{3}}{6-3} = \frac{\sqrt{3}}{3}$ $m(AB) \times m(BC) = -\sqrt{3} \times \frac{\sqrt{3}}{3} = -\frac{3}{3} = -1$	2	1-finding $m(BC)$ 1-shows = -1
	(iv) $d = \sqrt{(6-0)^2 + (\sqrt{3} - 3\sqrt{3})^2}$ $= \sqrt{36 + (-2\sqrt{3})^2}$ $= \sqrt{36 + 12} = \sqrt{48} = 4\sqrt{3}$	2	
	(v) AD will have the same gradient and length as CB. (across 3 and up $\sqrt{3}$) D=(3, $4\sqrt{3}$)	2	
	(vi) midpoint $= (\frac{0+6}{2}, \frac{3\sqrt{3}+\sqrt{3}}{2}) = (3, 2\sqrt{3})$	2	
(b)	If $\cot(\theta) = 1$ then $\tan(\theta) = 1$ $\tan(45) = 1$ $\sin(45) = \frac{1}{\sqrt{2}}$ but in quadrants 3 and 4 $\sin(\theta)$ is negative $\therefore \sin(\theta) = -\frac{1}{\sqrt{2}}$	2	

(c)	$\sqrt{\cos^2(90-\theta) \div \cos^2(\theta)} = \sqrt{\sin^2(\theta) \div \cos^2(\theta)}$ $= \sqrt{\tan^2(\theta)}$ $= \tan(\theta)$	2	

SECTION II

Question 16

(a)	$2^x \times 4^{x+1} = 0.5$ $2^x \times (2^2)^{x+1} = 2^{-1}$ $2^{3x+2} = 2^{-1}$ $3x+2 = -1$ $3x = -3$ $x = -1$	**2 Marks**: Correct answer. 1 Mark: Writes the terms to the base 2.
(b)	$f'(x) = \lim_{h\to 0} \frac{f(x+h)-f(x)}{h}$ $= \lim_{h\to 0} \frac{(x+h)^2 - x^2}{h}$ $= \lim_{h\to 0} \frac{x^2+2xh+h^2-x^2}{h}$ $= \lim_{h\to 0} \frac{2xh+h^2}{h}$ $= \lim_{h\to 0} (2x+h)$ $= 2x$	**3 Marks**: Correct answer. 1 Mark: Uses formula for first principles with one correct expression.
(c)	$f(-3)+f(0)+f(3) = 2^{-3}+1+3^{-1}$ $= \frac{1}{8}+1+\frac{1}{3} = \frac{35}{24}$	**2 marks**
(d)	$y' = 2x - 5$ when $x = 1$ $y' = -3$ $\therefore m$ of tangent $= -3$ $\therefore m$ of normal $= \frac{1}{3}$ $y - 2 = \frac{1}{3}(x-1)$ $3y - 6 = x - 1$ $x - 3y + 5 = 0$	**3 marks**

(e)	(i) $\angle BCA = \angle DCA$ (diagonals of a rhombus bisect the angle through which they pass)	**1 mark**
	(ii) In ΔBFC and ΔDFC $CF = CF$ (common side) $\angle BCF = \angle DCF$ (proven from part (i)) $BC = DC$ (adjacent sides of a rhombus are equal) $\therefore \Delta BFC \equiv \Delta DFC$ (SAS)	**3 Marks - for correct answer.** 2 Marks- Makes significant progress 1 Mark- One statement-reason
	(iii) $\angle AEB = \angle EBC$ (alternate angles are equal, $AD//BC$) Now $\angle AEB = 90°$. $\therefore \angle CBF = 90°$	**1 mark**