Year 10 Term 4 (Yearly Examination) 2020

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Name:_____ **Teacher**_____.

Marking sheet. Examiner's use only

Question	Number & Algebra (N&A)	Measurement & Geometry (M&G)	Statistics & Probability (S&P)	TOTALS:
Mentals	/20			
Part A	1-12 /12	13-17 /5	18-20 /3	/20
PART B Q21	**a-i /9**	**j-m /4**	**n-o /2**	/15
22		/20		/20
23	/28			/28
24	/24			/24
25		/16		/16
TOTALS:	**/93**	**/45**	**/5**	**/123**

Part A Answer Sheet

Select the alternative A, B, C or D that best answers the question.
Indicate your selection by filling in the corresponding circle.

									N&A	M&G	S&P
1.	A	O	B	O	C	O	D	O			
2.	A	O	B	O	C	O	D	O			
3.	A	O	B	O	C	O	D	O			
4.	A	O	B	O	C	O	D	O			
5.	A	O	B	O	C	O	D	O			
6.	A	O	B	O	C	O	D	O			
7.	A	O	B	O	C	O	D	O			
8.	A	O	B	O	C	O	D	O			
9.	A	O	B	O	C	O	D	O			
10.	A	O	B	O	C	O	D	O			
11.	A	O	B	O	C	O	D	O			
12.	A	O	B	O	C	O	D	O			
13.	A	O	B	O	C	O	D	O			
14.	A	O	B	O	C	O	D	O			
15.	A	O	B	O	C	O	D	O			
16.	A	O	B	O	C	O	D	O			
17.	A	O	B	O	C	O	D	O			
18.	A	O	B	O	C	O	D	O			
19.	A	O	B	O	C	O	D	O			
20.	A	O	B	O	C	O	D	O			
									/12	/5	/3

GIRRAWEEN HIGH SCHOOL

YEAR 10 YEARLY EXAMINATION

MATHEMATICS

2020

Time allowed: 2 hours

Reading Time: 5 minutes

Name: _____

Teacher: _____

INSTRUCTIONS TO STUDENTS

- Attempt all questions in Part A and Part B.
- The answers to all questions in Part A must be recorded in blue or black pen on separate Multiple-Choice answer sheet.
- Approved scientific calculators may be used in all parts of the examination.
- Diagrams are **NOT** drawn to scale unless otherwise stated.

Part A (20 Marks) :

Fill in the circle corresponding to the correct answer on the **Multiple-Choice Answer Sheet.**

1. Which of the following is **not** equivalent to $18a^2b^2$

   (A) $6ab \times 3ab$ (B) $11a^2b^2 + 7a^2b^2$

   (C) $2a^2 \times (3b)^2$ (D) $(9ab)^2$

2. If $16m^2 - 24m + P = (4m + Q)^2$, then

   (A) $P = 9 \text{ and } Q = 3$ (B) $P = 9 \text{ and } Q = -3$

   (C) $P = -9 \text{ and } Q = 3$ (D) $P = -9 \text{ and } Q = -3$

3. What is the solution to the equation $\log_2(x - 1) = 8$?

   (A) 4 (B) 17 (C) 65 (D) 257

4. If y is inversely proportional to x, the equation is of the form

   (A) $y = kx$ (B) $y = kx^2$ (C) $y = \frac{k}{x}$ (D) $y = \frac{x}{k}$

5. The exact value of $\frac{3^{3x} \times 8^x}{2^{3x} \times 27^x}$ is

   (A) 1 (B) $\frac{3}{2}$ (C) $\frac{27}{8}$ (D) $\left(\frac{3}{2}\right)^{3x}$

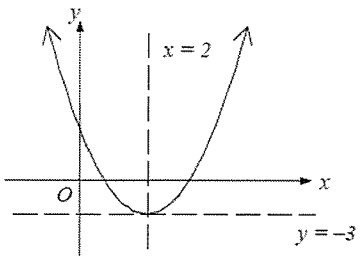
6. For any two real numbers $a, b > 0$, the value of $\log_a a^2 + \log_{\sqrt{a}} a^2$ is

   (A) 8 (B) 6 (C) 4 (D) 3

7. The remainder when $P(x) = x^4 - 3x^3 + 2x + 1$ is divided by $(x - 2)$ is

   (A) 37 (B) 2 (C) -3 (D) 13

8. Which equation best represent the following parabola?

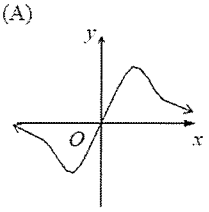


(A) $y = (x-2)^2 - 3$ (B) $y = (x-2)^2 + 3$

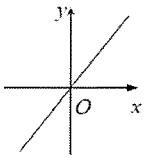
(C) $y = (x+2)^2 - 3$ (D) $y = (x+2)^2 + 3$

9. Which graph best represent $xy = 1$?

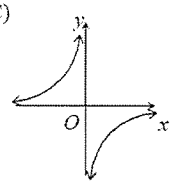
(A)



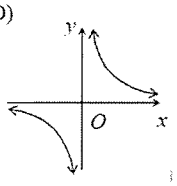
(B)



(C)



(D)



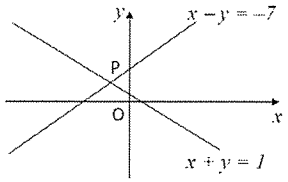
10. Which of the following does not represent a function?

(A) $y = 4 - x^2$ (B) $x^2 + y^2 = 9$

(C) $x + 2y - 8 = 0$ (D) $y = 3^x$

11. Which of the following are the coordinates of P?

NOT TO SCALE

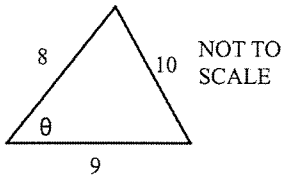


(A) $(-4,3)$ (B) $(-3,-4)$ (C) $(-3,4)$ (D) $(-2,3)$

12. The simplest form of the expression $\frac{1}{\sqrt{2}-1} - \sqrt{2}$ is

(A) 1 (B) $\sqrt{2}$ (C) $\sqrt{2}+1$ (D) $\sqrt{2}-1$

13. The diagram shows a triangle with sides lengths 8 m, 9 m and 10 m.

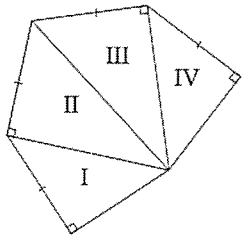


Which expression is the correct value for θ?

A) $\cos^{-1}\left(\frac{8^2+9^2-10^2}{2\times8\times9}\right)$ B) $\sin^{-1}\left(\frac{9\times\sin 10}{8}\right)$

C) $\sin^{-1}\left(\frac{8\times\sin 10}{9}\right)$ D) $\cos^{-1}\left(\frac{10^2+9^2-8^2}{2\times10\times9}\right)$

14. The diagram shows four triangles labelled I, II, III and IV. Which statement is true?



A) Triangle I is congruent to triangle II.

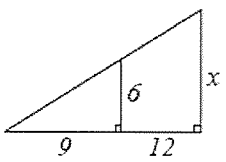
B) Triangle I is congruent to triangle IV and triangle II is congruent to triangle III.

C) Triangle I is congruent to triangle III

D) Triangle I is congruent to triangle II and triangle III is congruent to triangle IV.

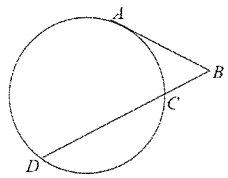
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15. What is the value of x ?



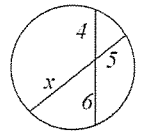
(A) 8 (B) 9 (C) 14 (D) 18

16. AB is tangent. $BC = 2cm, CD = 5cm$. The length of AB in centimetres is



(A) $\sqrt{10}$ (B) $\sqrt{14}$ (C) $\sqrt{20}$ (D) $\sqrt{35}$

17. The value of x is



NOT TO SCALE

(A) $3\frac{1}{3}$ (B) $4\frac{4}{5}$ (C) 7 (D) $7\frac{1}{2}$

18. Ryan has 2 different pairs of socks loose in a drawer. He takes out 2 socks without looking at them. What is the probability that he selects a matching pair.

(A) $\frac{1}{4}$ (B) $\frac{1}{3}$ (C) $\frac{1}{2}$ (D) $\frac{2}{3}$

19. 200 tickets are sold in a raffle in which 3 prizes are to be drawn by selecting 3 different tickets at random. Chris buys 3 tickets, and wins one of the first two prizes drawn.
What is the probability that Chris will now win the third prize?

(A) $\frac{1}{99}$ (B) $\frac{1}{100}$ (C) $\frac{1}{198}$ (D) $\frac{3}{200}$

20. The mean and standard deviation of a set of test scores are m and s respectively. If 4 marks are added to each score, what are the mean and standard deviation of the new set of scores?

(A) Mean = m, Standard Deviation = s.
(B) Mean = m + 4, Standard Deviation = s.
(C) Mean = m, Standard Deviation = s + 4.
(D) Mean = m + 4, Standard Deviation = s + 4.

PART B

QUESTION 21 (15 marks-1 mark each, write answers in the space provided)

a) Find the exact distance in the simplest form between the points $(-5,4)\ and\ (2,-3)$.

b) Find the midpoint of the interval joining $(7,12)\ and\ (-5,3)$.

c) Find the gradient of the line joining $(-4,7)\ and\ (-3,3)$

d) Find the value of b if the line $bx + 2y = 7$ is parallel to the line $y = 4x + 3$.

e) Solve the inequality $1 - \frac{x}{3} < 2$

f) Fully factorise $2mn - 3n + 6m - 9$

g) Simplify $\frac{x^2 + 3x + 2}{x + 2} =$

h) Solve the exponential equation for x: $11^{x-5} = \frac{1}{121}$

i) Make b the subject of the formula $m = \sqrt{\frac{a+b}{n}}$

j) Convert $0.0003km^2$ to cm^2

k) A cone has a radius of $10cm$. It has a volume of $1000cm^3$. Calculate the height of the cone correct to one decimal place.

l) Find the exact value of $\tan 150°$

m) A yacht is sailed from A to B on a bearing of $196°$. What would be the bearing to sail directly from B back to A.

n) Find the standard deviation for this set of scores. Give answer correct to two decimal places.

Score	1	2	3	4	5
Frequency	2	5	7	4	2

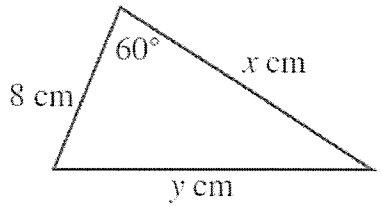
o) Find the interquartile range for a set of data if 75% of the data are above 2.6 and 25% of the data are above 3.7

QUESTION 22 (20 marks)

a) Solve this trigonometric equation for $0° \leq \theta \leq 360°$. **2m**

$\tan\theta = -1$

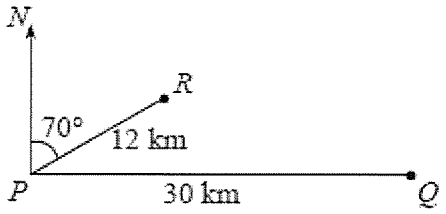
b) The area of the triangle is $22\sqrt{3}\ cm^2$.



i. Find the value of x. **3m**

ii. Hence find the exact value of y. **3m**

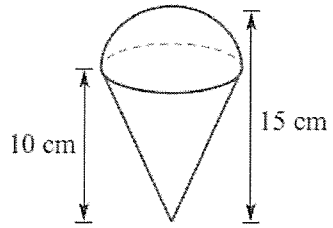
c) The diagram shows a point P which is 30 km due west of the point Q. The point R is 12km from P and has a bearing from P of 070°.



i. Find the distance of R from Q to the nearest km. **3m**

ii. Find the bearing of R from Q. **3m**

d) A hemisphere sits on a cone and two height measurements are given as shown.



Find:

i. the radius of the hemisphere. **1m**

ii. the exact slant height of the cone, in surd form. **2m**

iii. the surface area of the solid, correct to 1 decimal place. **3m**

QUESTION 23 (28 marks)

a) State the equation of each curve that would result if the curve $y = 2^x$ was

i. Translated 2 units to the left. **1m**

ii. Reflected in the y-axis and translated 2 units up. **2m**

b) State the domain and range for the function $f(x) = 4 - 2x^2$ **2m**

c) For the parabola $y = 24 - 2x - x^2$, find

i. the y-intercept **1m**

ii. the x-intercepts **2m**

iii. the axis of symmetry **2m**

iv. the vertex **2m**

v. Hence, sketch its graph showing all of the above features. **5m**

d) For the parabola $y = x^2 - 1$ and the line $y = mx - 4$, determine the exact value of the gradient, m, so that the line is tangent to the parabola. **3m**

e) For the hyperbola $y = \frac{-1}{x+2} + 1$

i. Find the equations of the asymptotes **2m**

ii. Find the x and y intercepts **2m**

iii. Sketch the graph labelling all of the above features. **4m**

QUESTION 24 (24 marks)

a) Find the value of x in the simplest form in these equations.

i. $\log_7 x = -3$ **2m**

ii. $\log_5 8 = \log_5 x - 2\log_5 3$ **3m**

b) If $\log_a b = 3.4 \; and \; \log_a c = 4.7$, find the value of

i. $\log_a abc$ **2m**

ii. $\log_a \frac{b^2}{c}$ **2m**

c) Divide $P(x) = x^3 - 4x^2 + 2x + 7 \; by \; (x - 3)$ and write in the form $P(x) = (x - 3)Q(x) + R$ where $Q(x)$ is the quotient and R is the remainder. **4m**

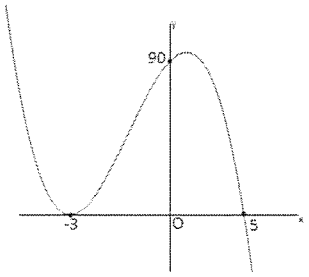
d) The polynomial $P(x) = x^3 + ax^2 + bx + 2$ has factors $x + 1$ *and* $x - 2$. Find the values of a *and* b. **4m**

e) If $P(x) = 5x + 2$ and$Q(x) = x^2 - 3x + 1$ find

i. deg$[P(x) \times Q(x)]$ **1m**

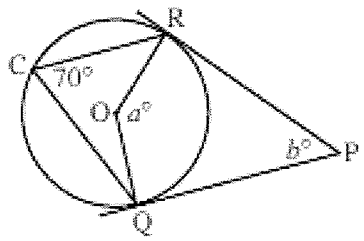
ii. $P(4) + P(-2)$ **2m**

f) Find the equation of the cubic polynomial in the sketch. Leave answer in the factored form. **4m**

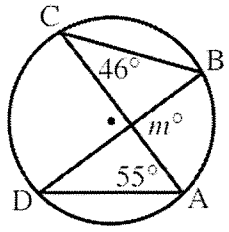


QUESTION 25 (16 marks)

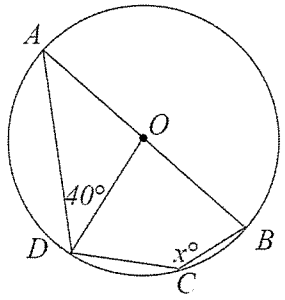
a) Find the value of the pronumerals giving reasons. O is the centre of the circle. **4m**



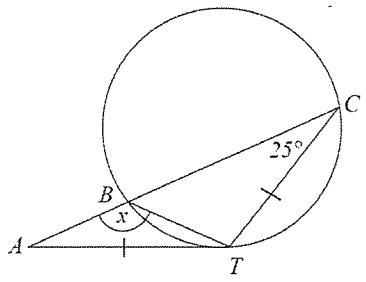
b) Find the value of the pronumeral giving reasons. **4m**



c) O is the centre of the circle. Calculate the value of x , giving reasons. **4m**



d) AT is a tangent to the circle at T. $TA = TC$. Find the value of x giving reasons. **4m**



Solutions

Year 10 Term 4 (Yearly Examination) 2020

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Name:_____ **Teacher**_____.

Marking sheet. Examiner's use only

Question	Number & Algebra (N&A)	Measurement & Geometry (M&G)	Statistics & Probability (S&P)	TOTALS:
Mentals	/20			
Part A	1-12 /12	13-17 /5	18-20 /3	/20
PART B Q21	**a-i /9**	**j-m /4**	**n-o /2**	/15
22		/20		/20
23	/28			/28
24	/24			/24
25		/16		/16
TOTALS:	**/93**	**/45**	**/5**	**/123**

Part A Answer Sheet

Select the alternative A, B, C or D that best answers the question.
Indicate your selection by filling in the corresponding circle.

									N&A	M&G	S&P
1.	A	○	B	○	C	○	D	●			
2.	A	○	B	●	C	○	D	○			
3.	A	○	B	○	C	○	D	●			
4.	A	○	B	○	C	●	D	○			
5.	A	●	B	○	C	○	D	○			
6.	A	○	B	●	C	○	D	○			
7.	A	○	B	○	C	●	D	○			
8.	A	●	B	○	C	○	D	○			
9.	A	○	B	○	C	○	D	●			
10.	A	○	B	●	C	○	D	○			
11.	A	○	B	○	C	●	D	○			
12.	A	●	B	○	C	○	D	○			
13.	A	●	B	○	C	○	D	○			
14.	A	○	B	●	C	○	D	○			
15.	A	○	B	○	C	●	D	○			
16.	A	○	B	●	C	○	D	○			
17.	A	○	B	●	C	○	D	○			
18.	A	○	B	●	C	○	D	○			
19.	A	●	B	○	C	○	D	○			
20.	A	○	B	●	C	○	D	○			
									/12	/5	/3

PART B

QUESTION 21 (15 marks-1 mark each, write answers in the space provided)

a) Find the exact distance in the simplest form between the points $(-5,4)$ *and* $(2,-3)$.

$d = \sqrt{(-5-2)^2+(4+3)^2}$

$= \sqrt{98} = 7\sqrt{2}$ units

b) Find the midpoint of the interval joining $(7,12)$ *and* $(-5,3)$.

$x = \frac{7-5}{2} = 1$

$y = \frac{12+3}{2} = 7\frac{1}{2}$

$M\left(1, 7\frac{1}{2}\right)$

c) Find the gradient of the line joining $(-4,7)$ *and* $(-3,3)$

$m = \frac{7-3}{-4+3} = \frac{4}{-1} = -4$

d) Find the value of b if the line $bx + 2y = 7$ is parallel to the line $y = 4x + 3$.

$2y = -bx + 7$

$y = -\frac{b}{2}x + \frac{7}{2}$

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

$b = -8$

e) Solve the inequality $1 - \frac{x}{3} < 2$

$-\frac{x}{3} < 1$

$x > -3$

f) Fully factorise $2mn - 3n + 6m - 9$

$n(2m-3) + 3(2m-3)$

$(2m-3)(n+3)$

g) Simplify $\frac{x^2+3x+2}{x+2} =$ $\frac{(x+1)(x+2)}{(x+2)} = x+1$

h) Solve the exponential equation for x: $11^{x-5} = \frac{1}{121} = 11^{-2}$

$x - 5 = -2$

$x = 3$

i) Make b the subject of the formula $m = \sqrt{\frac{a+b}{n}}$

$m^2 = \frac{a+b}{n}$

$a+b = m^2n$

$b = m^2n - a$

j) Convert $0.0003km^2$ to cm^2

$3000000\ cm^2$

k) A cone has a radius of $10cm$. It has a volume of $1000cm^3$. Calculate the height of the cone correct to one decimal place.

$V = \frac{1}{3}\pi r^2 h$

$1000 = \frac{1}{3} \times \pi \times 100 \times h$

$h = \frac{30}{\pi}$

$= 9.5\ cm$

l) Find the exact value of $\tan 150°$

$\tan(180-30) = -\tan 30^\circ = -\frac{1}{\sqrt{3}}$

m) A yacht is sailed from A to B on a bearing of 196°. What would be the bearing to sail directly from B back to A.

$016^\circ T$

n) Find the standard deviation for this set of scores. Give answer correct to two decimal places.

Score	1	2	3	4	5
Frequency	2	5	7	4	2

$\sigma = 1.12$

o) Find the interquartile range for a set of data if 75% of the data are above 2.6 and 25% of the data are above 3.7

$IQR = 3.7 - 2.6$

$= 1.1$

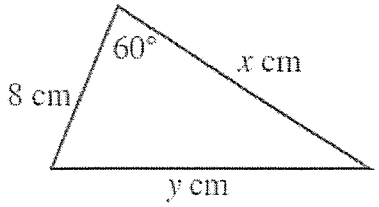
QUESTION 22 (20 marks)

a) Solve this trigonometric equation for $0° \leq \theta \leq 360°$. **2m**

$\tan\theta = -1$

$\theta = 135°, 315°$

b) The area of the triangle is $22\sqrt{3}\ cm^2$.



i. Find the value of x. **3m**

$\frac{1}{2} \times x \times 8 \times \sin 60 = 22\sqrt{3}$

$4x \times \frac{\sqrt{3}}{2} = 22\sqrt{3}$

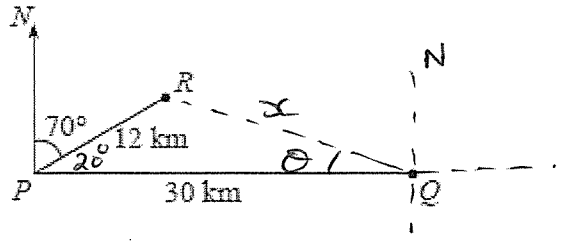
$x = 11$ cm

ii. Hence find the exact value of y. **3m**

$y = \sqrt{8^2 + 11^2 - 2 \times 8 \times 11 \times \cos 60}$

$= \sqrt{97}$ cm

c) The diagram shows a point P which is 30 km due west of the point Q. The point R is 12km from P and has a bearing from P of 070°.



i. Find the distance of R from Q to the nearest km. **3m**

$x = \sqrt{12^2 + 30^2 - 2 \times 12 \times 30 \times \cos 20}$

$= 19$ km (nearest km)

ii. Find the bearing of R from Q. **3m**

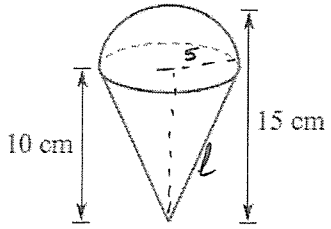
$\frac{\sin\theta}{12} = \frac{\sin 20}{19}$

$\sin\theta = \frac{12 \times \sin 20}{19}$

$\theta = 12°$

Bearing $= 282°$

d) A hemisphere sits on a cone and two height measurements are given as shown.



Find:

i. the radius of the hemisphere. $= 15 - 10 = 5$ cm **1m**

ii. the exact slant height of the cone, in surd form. **2m**

$l = \sqrt{10^2 + 5^2} = \sqrt{125} = 5\sqrt{5}$ cm

iii. the surface area of the solid, correct to 1 decimal place. **3m**

$SA = 2\pi r^2 + \pi r l$

$= 2 \times \pi \times 5^2 + \pi \times 5 \times 5\sqrt{5}$

$= 332.7 \text{ cm}^2$

QUESTION 23 (28 marks)

a) State the equation of each curve that would result if the curve $y = 2^x$ was

i. Translated 2 units to the left. **1m**

$y = 2^{x+2}$

ii. Reflected in the y-axis and translated 2 units up. **2m**

$y = 2^{-x} + 2$

b) State the domain and range for the function $f(x) = 4 - 2x^2$ **2m**

Domain : all real x

Range : $y \leq 4$

c) For the parabola $y = 24 - 2x - x^2$, find

i. the y-intercept **1m**

$y = 24$

ii. the x-intercepts **2m**

$x^2 + 2x - 24 = 0$ $\quad x = -6, \; x = 4$

$(x+6)(x-4) = 0$

iii. the axis of symmetry **2m**

$x = \frac{-6+4}{2}$, $\quad x = -1$

iv. the vertex **2m**

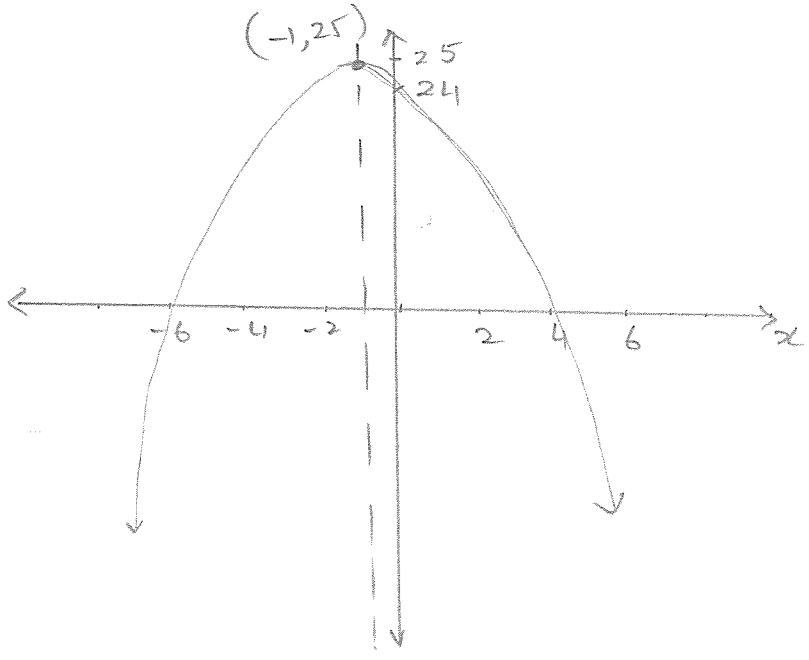
$y = 24 - 2x - 1 - 1$

$= 24 + 2 - 1$

$= 25$

Vertex $(-1, 25)$

v. Hence, sketch its graph showing all of the above features. **5m**



d) For the parabola $y = x^2 - 1$ and the line $y = mx - 4$, determine the exact value of the gradient, m, so that the line is tangent to the parabola. **3m**

$y = x^2 - 1$ — ①

$y = mx - 4$ — ②

Solve simultaneously

$x^2 - 1 = mx - 4$

$x^2 - mx + 3 = 0$

For line to be tangent

$\Delta = b^2 - 4ac = 0$

$(-m)^2 - 4 \times 1 \times 3 = 0$

$m^2 - 12 = 0$

$m = \pm\sqrt{12}$

$= \pm 2\sqrt{3}$

e) For the hyperbola $y = \frac{-1}{x+2} + 1$

i. Find the equations of the asymptotes **2m**

$x = -2$ and $y = 1$

ii. Find the x and y intercepts **2m**

x-int:

Sub $y = 0$

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

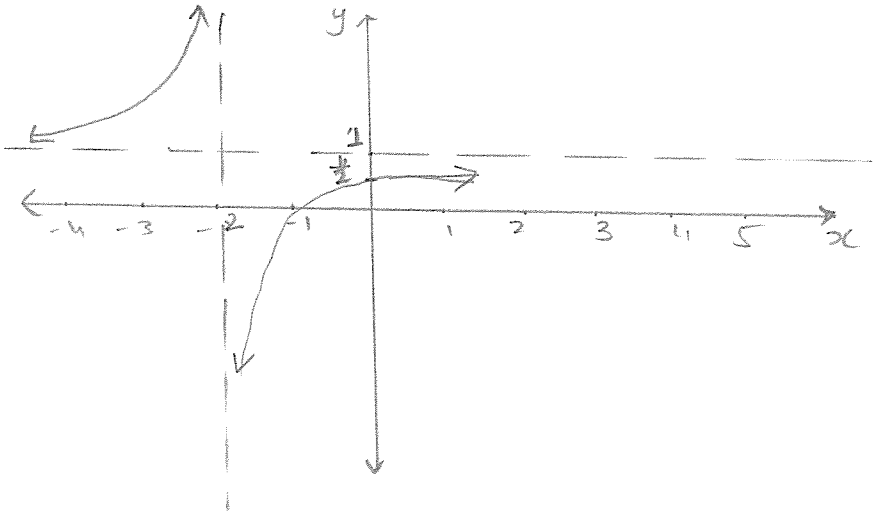
$x = -1$

y-int: Sub $x = 0$

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

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

iii. Sketch the graph labelling all of the above features. **4m**



QUESTION 24 (24 marks)

a) Find the value of x in the simplest form in these equations.

i. $\log_7 x = -3$ **2m**

$x = 7^{-3} = \frac{1}{343}$

ii. $\log_5 8 = \log_5 x - 2\log_5 3$ **3m**

$\log_5 x = \log_5 8 + \log_5 3^2$ $\quad x = 72$

$\log_5 x = \log_5 (8 \times 9)$

b) If $\log_a b = 3.4$ *and* $\log_a c = 4.7$, find the value of

i. $\log_a abc$ **2m**

$= \log_a a^a + \log_a b + \log_a c$

$= 1 + 3.4 + 4.7$

$= 9.1$

ii. $\log_a \frac{b^2}{c}$ **2m**

$= \log_a b^2 - \log_a c$

$= 2\log_a b - \log_a c$

$= 2 \times 3.4 - 4.7 = 2.1$

c) Divide $P(x) = x^3 - 4x^2 + 2x + 7$ *by* $(x - 3)$ and write in the form $P(x) = (x - 3)Q(x) + R$ where $Q(x)$ is the quotient and R is the remainder. **4m**

$$
\begin{array}{r}
x^2 - x - 1 \\
x-3 \;\overline{)\; x^3 - 4x^2 + 2x + 7} \\
\underline{-\,(x^3 - 3x^2)} \\
-x^2 + 2x \\
\underline{-\,(-x^2 + 3x)} \\
-x + 7 \\
\underline{-\,(-x + 3)} \\
4
\end{array}
$$

$P(x) = (x-3)(x^2 - x - 1) + 4$

d) The polynomial $P(x) = x^3 + ax^2 + bx + 2$ has factors $x + 1$ *and* $x - 2$. Find the values of a *and* b. **4m**

$P(-1) = -1 + a - b + 2 = 0$

$a - b = -1 \quad \cdots (1)$

$P(-2) = 8 + 4a + 2b + 2 = 0$

$2a + b = -5 \quad \cdots (2)$

$a = -2$

$b = -1$

$(2) - (1) \quad 3a = -6$

Sub $a = -2$ into (1) $\quad -2 - b = -1$

$b = -1$

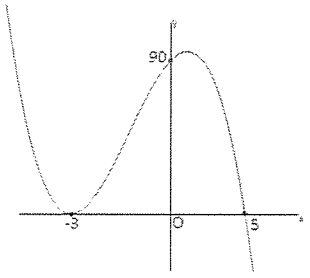
e) If $P(x) = 5x + 2$ and $Q(x) = x^2 - 3x + 1$ find

i. $\deg[P(x) \times Q(x)]$ 3 **1m**

ii. $P(4) + P(-2)$ **2m**

$22 - 8 = 14$

f) Find the equation of the cubic polynomial in the sketch. Leave answer in the factored form. **4m**



$y = a(x+3)^2(x-5)$

Sub $x = 0, \; y = 90$

$90 = a \times 9 \times -5$

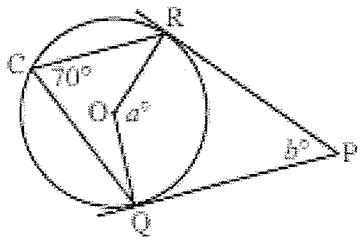
$-45a = 90$

$a = -2$

∴ equation is $y = -2(x+3)^2(x-5)$

QUESTION 25 (16 marks)

a) Find the value of the pronumerals giving reasons. O is the centre of the circle. **4m**



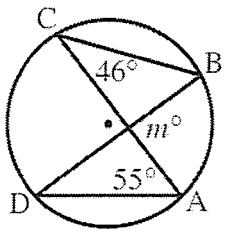
$a = 140^\circ$ (angle at the centre is double the angle at the circumference)

$\angle ORP = \angle OQP = 90^\circ$ (tangent ⊥ radius)

$b = 360 - 140 - 90 - 90$ (angle sum of a quadrilateral)

$= 40^\circ$

b) Find the value of the pronumeral giving reasons. **4m**



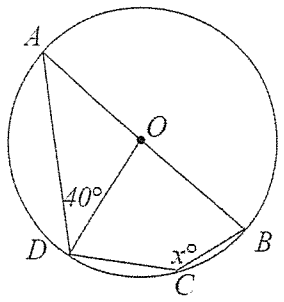
$\angle CBD = 55^\circ$ (angle in the same segment)

OR $\angle BDA = 46^\circ$ (angle in the same segment)

$m = 46 + 55$ (exterior angle is the sum of the two opposite interior angles)

$= 101^\circ$

c) O is the centre of the circle. Calculate the value of x, giving reasons. **4m**



In $\triangle OAD$

$\angle OAD = 40^\circ$ ($\because OA = OD$ = radii of a circle

$\therefore \triangle OAD$ is isosceles $\triangle$

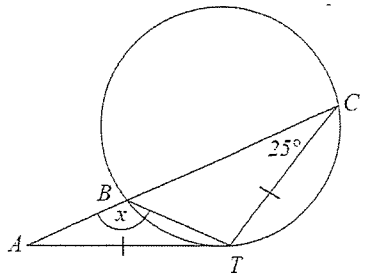
and angles opposite the equal sides are equal)

$x = 180 - \angle OAD$ (opposite angles are supplementary in cyclic quadrilaterals)

$= 180 - 40$

$= 140^\circ$

d) AT is a tangent to the circle at T. $TA = TC$. Find the value of x giving reasons. **4m**



In $\triangle TAC$

$\angle TAC = 25^\circ$ (angles opposite equal sides in isosceles $\triangle$'s)

$\angle ATB = 25^\circ$ (angle between the tangent and the chord equals the angle in the alternate segment)

$x = 180 - 25 - 25$ (angle sum of a triangle)

$= 130^\circ$