The Scots College

Name: _____

Teacher: _____

2024 Year 10 Assessment Task 4

Monday 4th November

Mathematics 5.3

Weighting: 40%
Total marks: 75

General Instructions

- Reading time – 5 minutes
- Working time – 90 minutes
- Write using black pen
- Calculators approved by NESA may be used
- A multiple-choice answer sheet is provided separately
- Show mathematical reasoning and/or calculations in Sections 2 - 4

Multiple Choice Section 1	
Section 2	
Section 3	
Section 3	
Section 4	
Total	

Section 1 – 8 marks (pages 3–6)
- Attempt Question 1– 8
- Allow about 10 minutes for this section
- Answer on the multiple-choice sheet provided

Section 2 – 22 marks (pages 7–11)
- Attempt Questions 9–17
- Allow about 25 minutes for this section

Section 3 – 22 marks (pages 12-17)
- Attempt Questions 18–23
- Allow about 30 minutes for this section

Section 4 – 23 marks (pages 18-22)
- Attempt Questions 24–30
- Allow about 25 minutes for this section

BLANK PAGE

Section 1

8 marks
Attempt Questions 1–8.
Allow about 10 minutes for this section.

Use the multiple-choice answer sheet for Questions 1 – 8.

---

1 What is the gradient of the line with equation $6x - 2y + 6 = 0$?

A. -1

B. -3

C. 6

D. 3

2 Which expression is equivalent to $(x^{-3} \div x^{6})^{-2}$?

A. x^{-18}

B. x^{18}

C. x^{6}

D. x^{36}

3 What is the domain of the function $f(x) = \frac{4}{\sqrt{-x}}$?

A. $x \geq 0$

B. $x > 0$

C. $x \leq 0$

D. $x < 0$

4 In Box Hill, it rains on average 22 times in July.

Which expression could be used to best find the probability that it will rain on any two consecutive days in July?

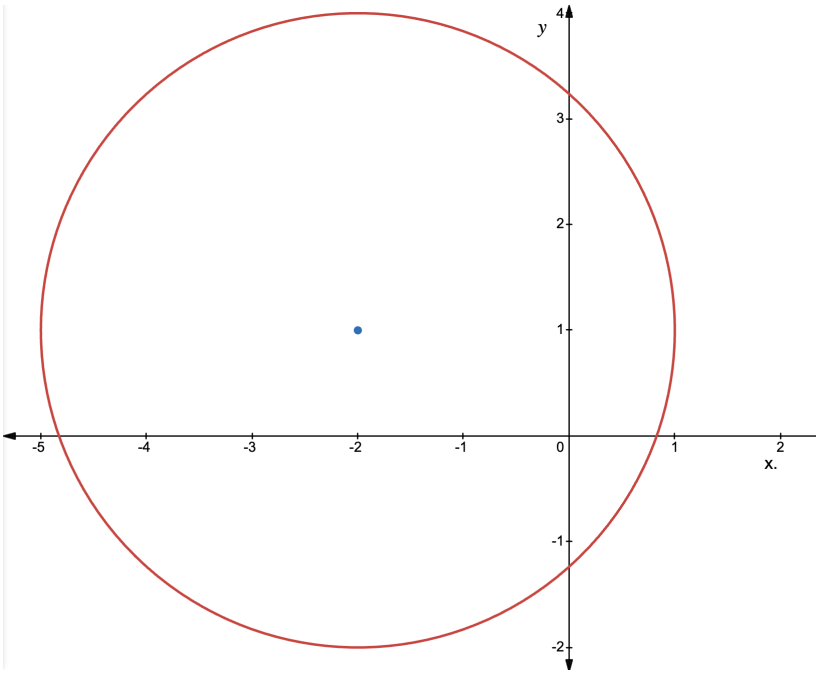
A. $\frac{22}{31} \times \frac{21}{30}$

B. $\frac{22}{31} \times \frac{22}{31}$

C. $\frac{22}{31} \times \frac{21}{31}$

D. $\frac{22}{31} \times \frac{22}{30}$

5 Which of the equations best represents the below graph?



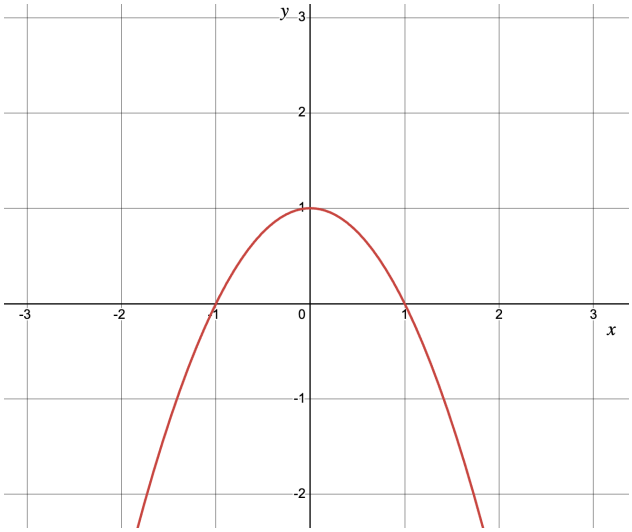
A. $(x-2)^2 + (y-1)^2 = 9$

B. $(x+2)^2 + (y+1)^2 = 3$

C. $(x+2)^2 + (y-1)^2 = 9$

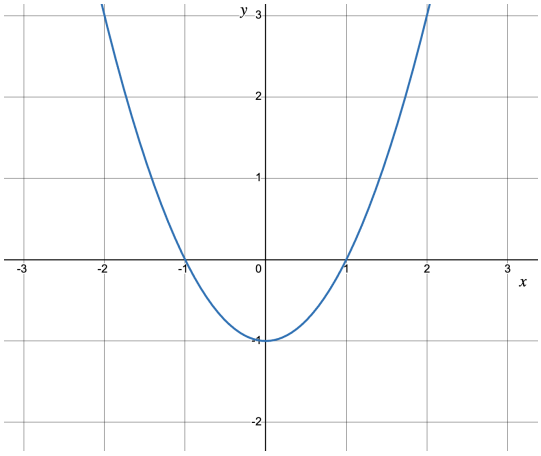
D. $(x+2)^2 + (y+1)^2 = 9$

6 The diagram shows the graph of $y = f(x)$.

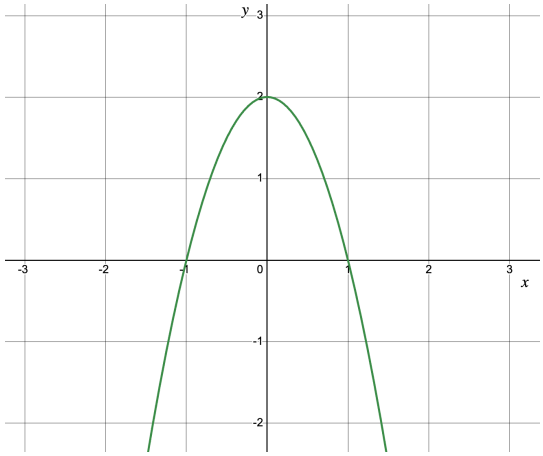


Which of the diagrams below represents $y = -2f(x)$?

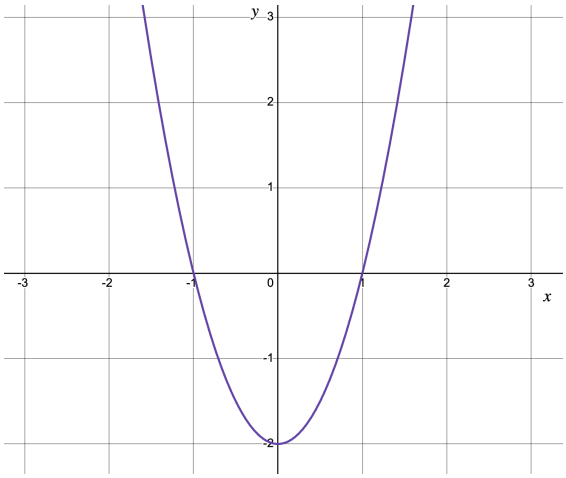
A.



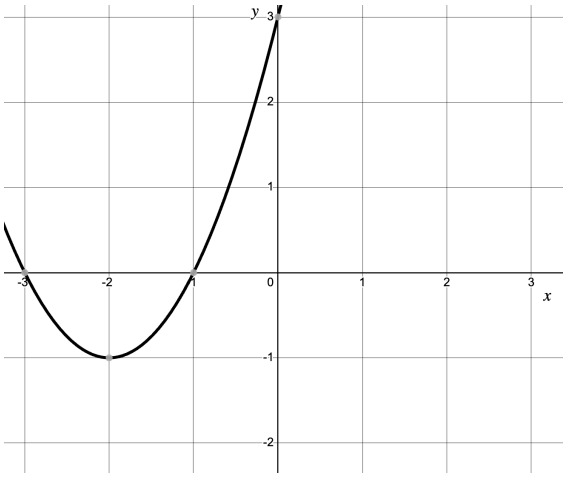
B.



C.



D.



7 Which quadratic equation has no real solutions?

A. $0 = x^2 + 3x + 9$

B. $0 = x^2 - 4x + 4$

C. $0 = x^2 + 5x + 6$

D. $0 = x^2 + 2x + 1$

8 Which list of integers satisfies the inequality below?

$$-9 < \frac{x}{4} - 1 < -8$$

A. $x = -33, -32, -31$

B. $x = -31, -30, -29$

C. $x = -29, -28, -27, -26$

D. $x = -32, -31, -30, -29, -28$

END OF SECTION 1

All questions must be answered in the space provided

SECTION 2

Question 9 (3 marks)

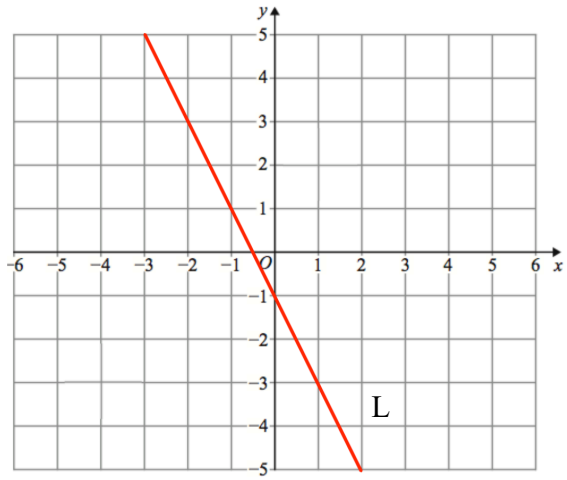
Solve the following pair of simultaneous equations: **3**

$$5x - 3y = 18$$

$$2x + 4y = 54$$

Question 10 (2 marks)

The straight-line L is shown on the grid. Find the equation of line L **2**



Question 11 (2 marks)

Solve $2x^2 - 5x - 6 = 0$. Give your answer in exact form. **2**

Question 12 (3 marks) **1**

a) Write the equation $7^x = 3$ in logarithmic form

---

b) Find the positive value of x in the equation $\log_x 81 = 4$ **2**

Question 13 (2 marks)

Make x the subject of the formula: $x^3 + 4 = 9y$ **2**

Question 14 (2 marks)

Fully simplify the following expression. **You must show clear working at every step.** **2**

$$\sqrt{600} - \sqrt{24}$$

Question 15 (2 marks)

Simplify $\left(\frac{a^{\frac{2}{3}}}{b^{\frac{4}{3}}}\right)^{\frac{3}{2}}$ **2**

Question 16 (3 marks)

Simplify fully $\frac{2x^2-4x}{4x} \div \frac{x^2-4}{2x^2}$ **3**

Question 17 (3 marks)

Rationalise and fully simplify the following expression. **You must show each step of your working clearly.** **3**

$$\frac{\sqrt{11}-\sqrt{5}}{\sqrt{11}+\sqrt{5}}$$

END OF SECTION 2

SECTION 3

Question 18 (4 marks)

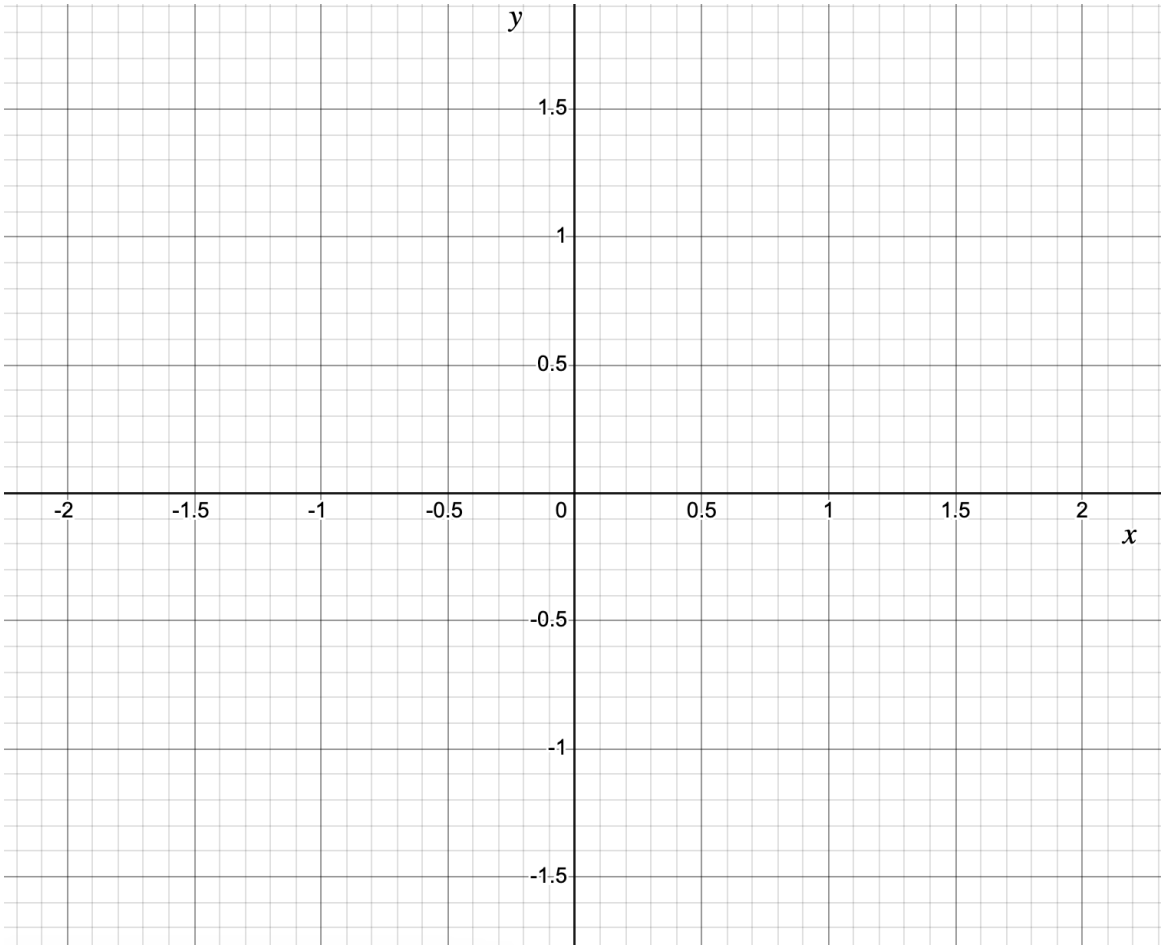
(a) Fill in the table of values below for the given equation. Round each answer to 2 decimal places. **2**

$$y = log_{10}(x + 1)$$

$\boldsymbol{x}$	-0.5	0	0.5	1	1.5
y					

(b) Sketch the graph for this equation, labelling any intercepts and asymptotes clearly. **2**

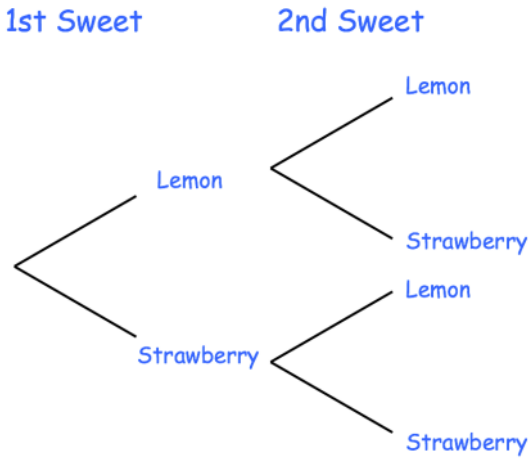
$$y = \log_{10}(x + 1)$$



Question 19 (5 marks)

There are 5 lemon and 4 strawberry sweets in a bag. Hailey takes out a sweet at random, writes down its flavour and puts it back into the bag. Then Hailey takes out a second sweet, at random, and writes down its flavour.

(a) Complete the probability tree diagram and include a list of all possible outcomes. **2**

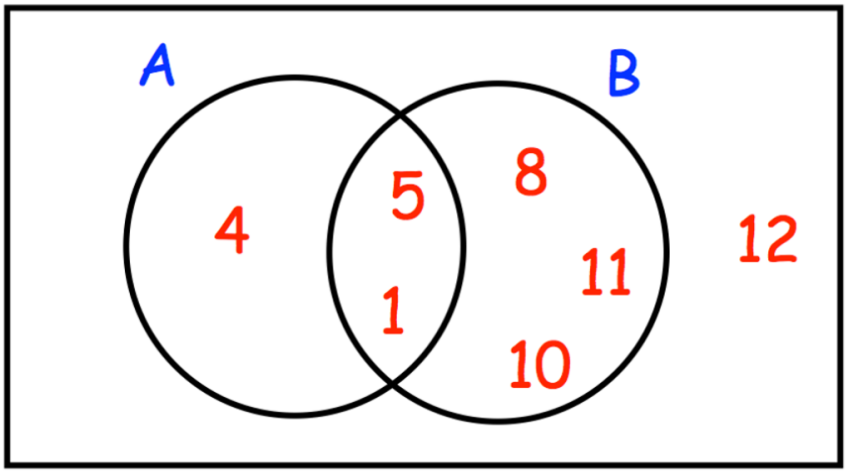


(b) Find the probability that both sweets selected are lemon. **1**

(c) Find the probability that a lemon and strawberry sweet are selected. **2**

Question 20 (3 marks)

Set A is a list of Sam's favourite single-digit numbers and Set B is the number of hours that some students spent revising for their maths test. This has been represented in the below Venn Diagram:



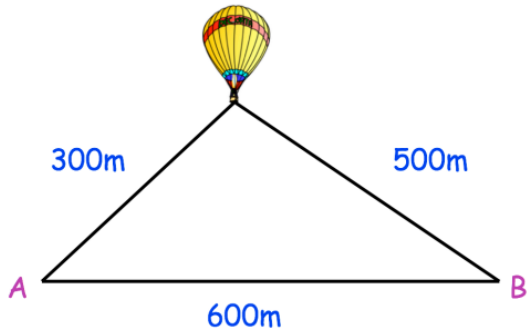
(a) Find $P(A)$ **1**

(b) Find $P(A \cap \bar{B})$ **1**

(c) Find $P(B|A)$ **1**

Question 21 (4 marks)

A hot air balloon is flying above two points on the ground at point A and point B, which are 600m apart. The hot air balloon is 300m from A and 500m from B.



(Potentially useful formulas:)

$$A = \frac{1}{2}ab\sin C$$

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$c^2 = a^2 + b^2 - 2ab\cos C$$

$$\cos C = \frac{a^2 + b^2 - c^2}{2ab}$$

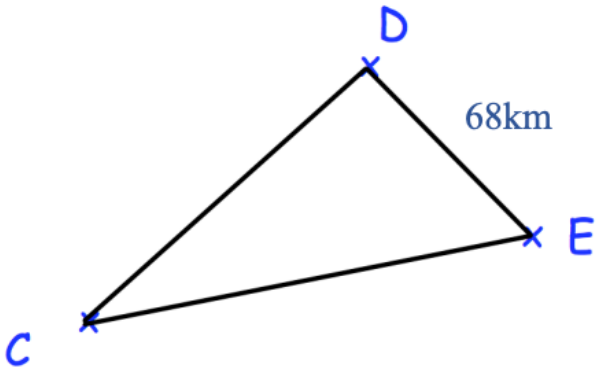
a) Work out the angle of elevation of the balloon from point B.
Round your angle to the nearest degree. **2**

b) By using your rounded answer from part a), calculate the height of the hot air balloon from the ground. Round your answer to the nearest metre if appropriate. **2**

Question 22 (3 marks)

Earlsfield (E) is on a bearing of 085° from Croydon (C) and on a bearing of 155° from Dorking (D). Dorking is on a bearing of 040° from Croydon. The distance between Dorking and Earlsfield is 68km.

Find the distance of Earlsfield from Croydon. Round your answer to the nearest metre. **3**



(Potentially useful formulas:)

$$A = \frac{1}{2}ab\sin C$$

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

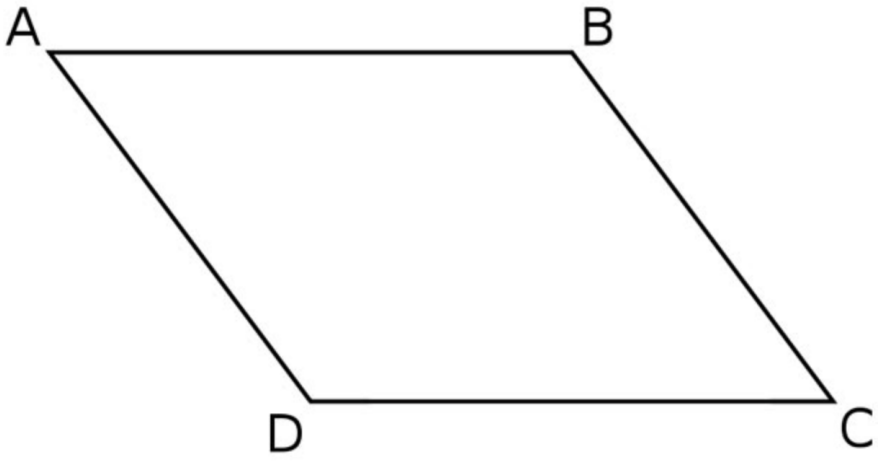
$$c^2 = a^2 + b^2 - 2ab\cos C$$

$$\cos C = \frac{a^2 + b^2 - c^2}{2ab}$$

Question 23 (3 marks)

Parallelogram ABCD has side lengths AB = 7cm and BC = 9cm. Angle BCD = 65°.

Find the area of this parallelogram. Round your answer to 1 decimal place. **3**



END OF SECTION 3

SECTION 4

Question 24 (2 marks)

Solve $5^{2x+1} = 25$. **2**

Question 25 (2 marks)

Calculate the length of MN. Round you answer to 2 decimal places. **2**

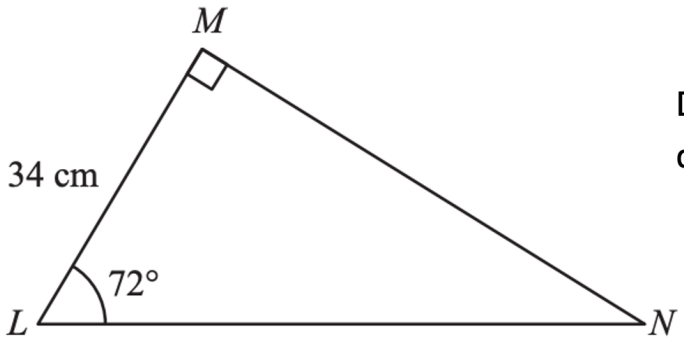


Diagram **NOT** drawn to scale

Question 26 (3 marks)

Solve $\log_3(x+1) - \log_3(x-2) = \log_3(5)$ **3**

Question 27 (3 marks)

Consider the quadratic function $y = x^2 + 4x - 5$.

(a) By completing the square, express $y = x^2 + 4x - 5$ in the form $y = (x+h)^2 + k$, where h and k are integers. **2**

(b) State the coordinates of the vertex of $y = x^2 + 4x - 5$ **1**

Question 28 (3 marks)

a) If θ is acute, find the value of θ in $cos\theta = \cos\ 286°$ **1**

b) If $0° \leq \theta \leq 360°$, then find the two values of θ that satisfies the equation: **2**

$$sin\theta = \frac{\sqrt{3}}{2}$$

Question 29 (6 marks)

Point A has coordinates $(2, 3)$ and point B has coordinates $(-4, 7)$.

(a) Find the midpoint of the line AB. **2**

(b) Find the gradient of the line AB. **All working must be shown clearly.** **2**

(c) Show that the equation of line AB is $y = -\frac{2x}{3} + \frac{13}{3}$ **2**

Question 30 (4 marks)

Consider the function $f(x) = \frac{4x}{5} + 3$

(a) Determine the equation of $f^{-1}(x)$ **2**

(b) Find a simplified expression for $f\big(f(x)\big)$ **2**

End of Paper

Additional writing space

If you use this space, clearly indicate which question you are answering.

Additional writing space

If you use this space, clearly indicate which question you are answering.

The Scots College

Name: HB Solutions

Teacher: _____

2024 Year 10 Assessment Task 4

Monday 4th November

Mathematics 5.3

Weighting: 40%
Total marks: 75

General Instructions

- Reading time – 5 minutes
- Working time – 90 minutes
- Write using black pen
- Calculators approved by NESA may be used
- A multiple-choice answer sheet is provided separately
- Show mathematical reasoning and/or calculations in Sections 2 - 4

Multiple Choice Section 1	
Section 2	
Section 3	
Section 3	
Section 4	
Total	

Section 1 – 8 marks (pages 3–6)
- Attempt Question 1– 8
- Allow about 10 minutes for this section
- Answer on the multiple-choice sheet provided

Section 2 – 22 marks (pages 7–11)
- Attempt Questions 9–17
- Allow about 25 minutes for this section

Section 3 – 22 marks (pages 12-17)
- Attempt Questions 18–23
- Allow about 30 minutes for this section

Section 4 – 23 marks (pages 18-22)
- Attempt Questions 24–30
- Allow about 25 minutes for this section

BLANK PAGE

Section 1

8 marks
Attempt Questions 1–8.
Allow about 10 minutes for this section.

Use the multiple-choice answer sheet for Questions 1 – 8.

---

1 What is the gradient of the line with equation $6x - 2y + 6 = 0$?

$6x + 6 = 2y$
$3x + 3 = y$

A. -1

B. -3

C. 6

D. 3

2 Which expression is equivalent to $(x^{-3} \div x^{6})^{-2}$?

$(x^{9})^{-2}$

A. x^{-18}

B. x^{18}

C. x^{6}

D. x^{36}

3 What is the domain of the function $f(x) = \frac{4}{\sqrt{-x}}$?

A. $x \geq 0$

B. $x > 0$

C. $x \leq 0$

D. $x < 0$

4 In Box Hill, it rains on average 22 times in July.

Which expression could be used to best find the probability that it will rain on any two consecutive days in July?

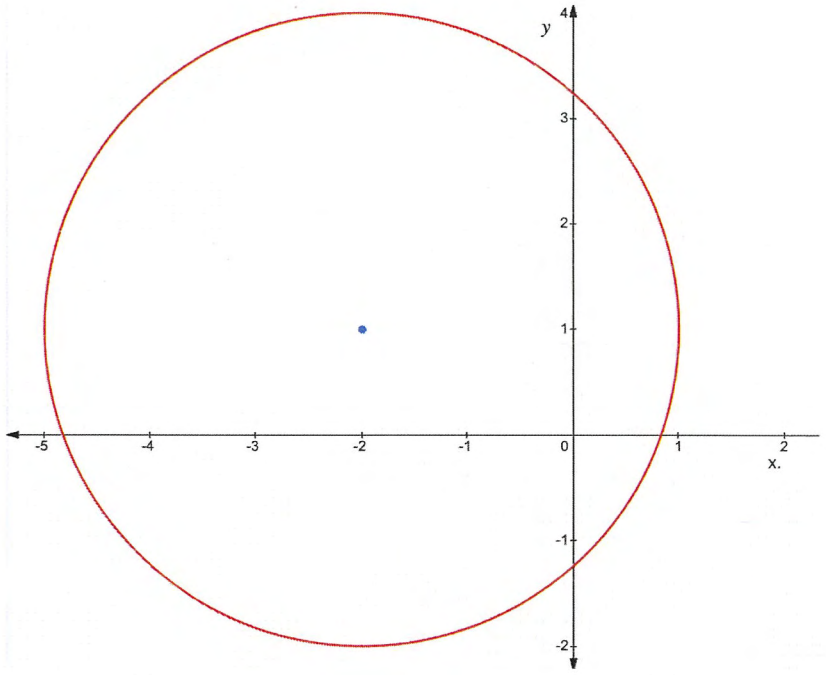
A. $\frac{22}{31} \times \frac{21}{30}$

B. $\frac{22}{31} \times \frac{22}{31}$

C. $\frac{22}{31} \times \frac{21}{31}$

D. $\frac{22}{31} \times \frac{22}{30}$

5 Which of the equations best represents the below graph?



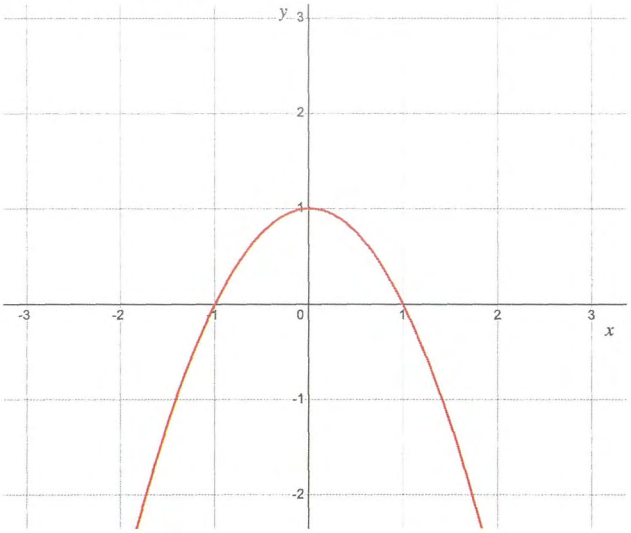
A. $(x-2)^2 + (y-1)^2 = 9$

B. $(x+2)^2 + (y+1)^2 = 3$

C. $(x+2)^2 + (y-1)^2 = 9$

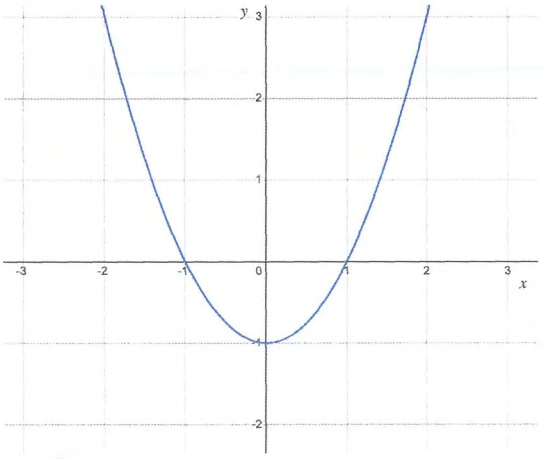
D. $(x+2)^2 + (y+1)^2 = 9$

6 The diagram shows the graph of $y = f(x)$.

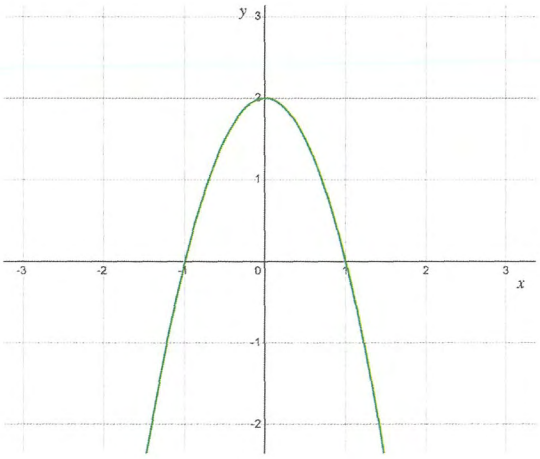


Which of the diagrams below represents $y = -2f(x)$?

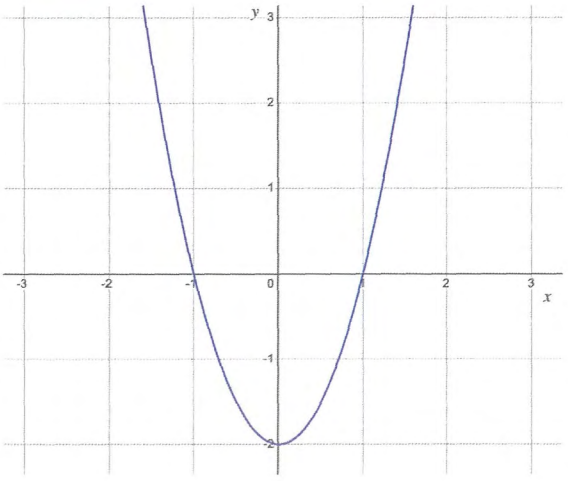
A.



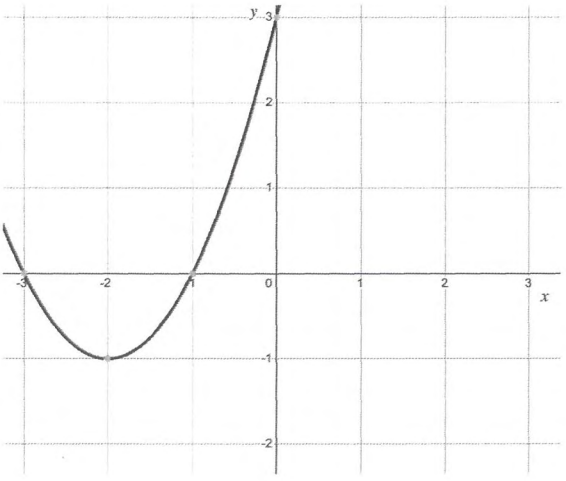
B.



C.



D.



7 Which quadratic equation has no real solutions?

A. $0 = x^2 + 3x + 9$

B. $0 = x^2 - 4x + 4$

C. $0 = x^2 + 5x + 6$

D. $0 = x^2 + 2x + 1$

8 Which list of integers satisfies the inequality below?

$$-9 < \frac{x}{4} - 1 < -8$$

A. $x = -33, -32, -31$

B. $x = -31, -30, -29$

C. $x = -29, -28, -27, -26$

D. $x = -32, -31, -30, -29, -28$

$-8 < \frac{x}{4} < -7$

$-32 < x < -28$

$-31, -30, -29$

END OF SECTION 1

All questions must be answered in the space provided

SECTION 2

Question 9 (3 marks)

Solve the following pair of simultaneous equations: 3

$$5x - 3y = 18 \quad (1) \times 2$$
$$2x + 4y = 54 \quad (2) \times 5$$

$10x - 6y = 36$ (3)

$10x + 20y = 270$ (4) (1)

(4) − (3) $26y = 234$

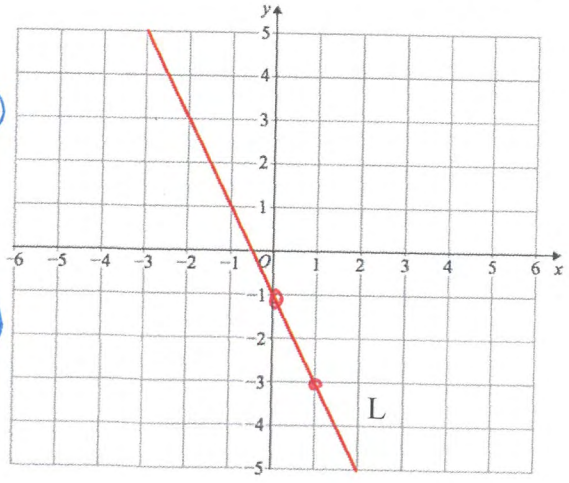
$y = 9$ (1)

(2) $2x + 36 = 54 \rightarrow 2x = 18$

$x = 9$ (1)

Question 10 (2 marks)

The straight-line L is shown on the grid. Find the equation of line L 2



$b = -1$ (0.5)

$m = \frac{-2}{1}$

$m = -2$ (0.5)

2) $y = -2x - 1$ (1)

Question 11 (2 marks)

Solve $2x^2 - 5x - 6 = 0$. Give your answer in exact form. 2

$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

$x = \frac{5 \pm \sqrt{(-5)^2-4\times(2)\times(-6)}}{4}$ (1)

$x = \frac{5 \pm \sqrt{25+48}}{4}$

$x = \frac{5 \pm \sqrt{73}}{4}$ (1)

Question 12 (3 marks)

a) Write the equation $7^x = 3$ in logarithmic form 1

$\log_7(3) = x$ (1)

b) Find the positive value of x in the equation $\log_x 81 = 4$ 2

$x^4 = 81$ (1)

$x = \sqrt[4]{81} \Rightarrow x = 3$ (1)

Question 13 (2 marks)

Make x the subject of the formula: $x^3 + 4 = 9y$ **2**

$x^3 = 9y - 4$ (1)

$x = \sqrt[3]{9y - 4}$ (1)

Question 14 (2 marks)

Fully simplify the following expression. **You must show clear working at every step.** **2**

$$\sqrt{600} - \sqrt{24}$$

1 4 9 16 25 36 49 81 100

$\sqrt{100} \times \sqrt{6} - \sqrt{4} \times \sqrt{6}$ (0.5)

$10\sqrt{6} - 2\sqrt{6}$ (0.5)

$8\sqrt{6}$ (1)

Question 15 (2 marks)

Simplify $\left(\frac{a^{\frac{2}{3}}}{b^{\frac{4}{3}}}\right)^{\frac{3}{2}}$ **2**

a^1 (1)

b^2 (1)

Question 16 (3 marks)

Simplify fully $\frac{2x^2-4x}{4x} \div \frac{x^2-4}{2x^2}$ **3**

$\frac{2x^2-4x}{4x} \times \frac{2x^2}{x^2-4}$ (1)

(0.5) $\frac{2x-4}{4} \times \frac{2x^2}{(x+2)(x-2)}$ (0.5)

$\frac{2(x-2) \times 2x^2}{4(x+2)(x-2)}$

$\frac{x^2}{(x+2)}$ (1)

Question 17 (3 marks)

Rationalise and fully simplify the following expression. **You must show each step of your working clearly.** **3**

$$\frac{\sqrt{11}-\sqrt{5}}{\sqrt{11}+\sqrt{5}}$$

$$\frac{\sqrt{11}-\sqrt{5}}{\sqrt{11}+\sqrt{5}} \times \frac{(\sqrt{11}-\sqrt{5})}{(\sqrt{11}-\sqrt{5})} \quad (1)$$

$$\frac{(\sqrt{11}-\sqrt{5})(\sqrt{11}-\sqrt{5})}{(11-5)}$$

$$\frac{11-\sqrt{55}-\sqrt{55}+5}{6} \quad (1)$$

$$\frac{16-2\sqrt{55}}{6} \quad (0.5)$$

$$\frac{8-\sqrt{55}}{3} \quad (0.5)$$

END OF SECTION 2

SECTION 3

Question 18 (4 marks)

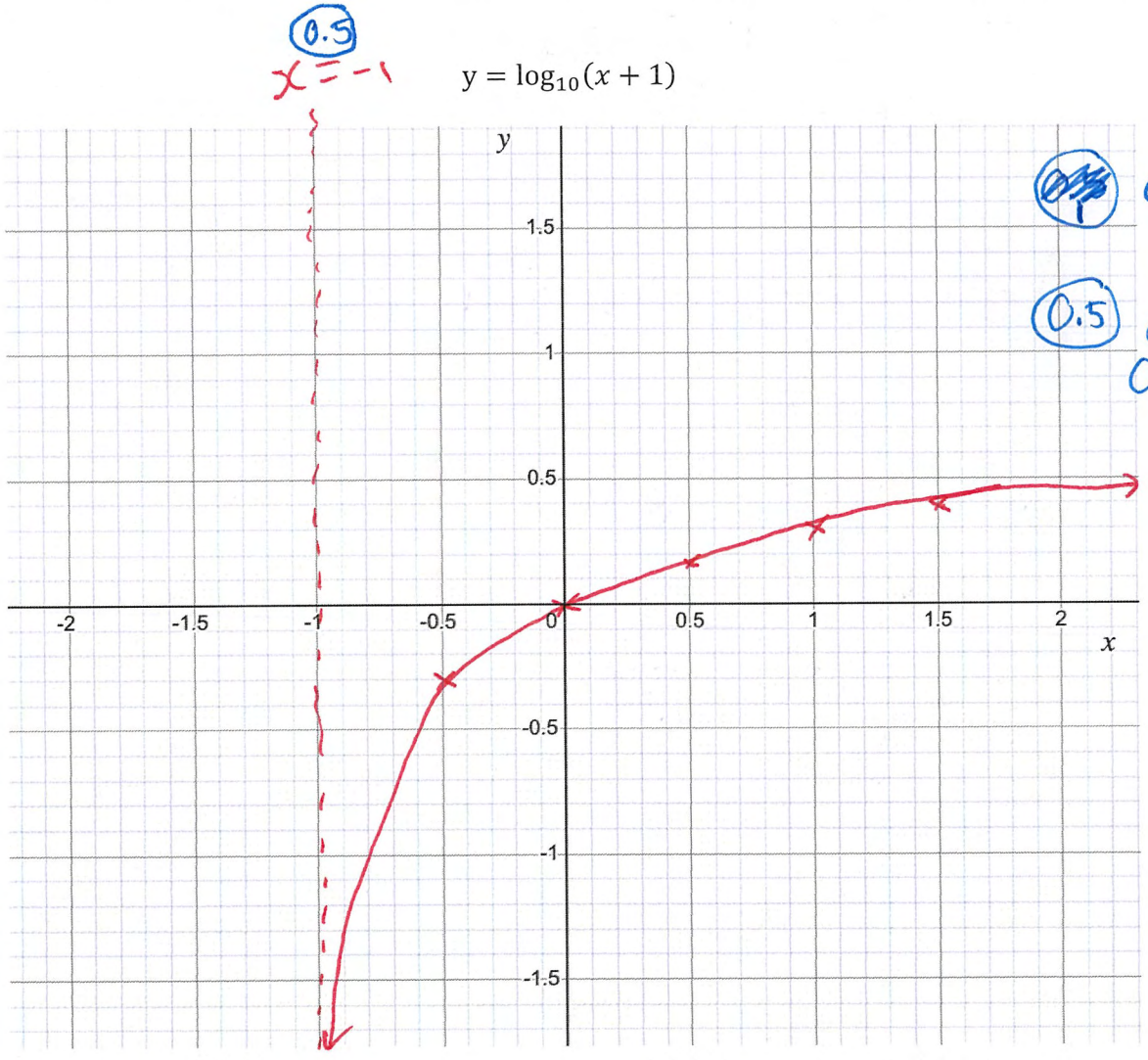
(a) Fill in the table of values below for the given equation. Round each answer to 2 decimal places. **2**

$$y = log_{10}(x + 1)$$

x	-0.5	0	0.5	1	1.5
y	-0.30	0	0.18	0.30	0.40

(2) : all correct
(1.5) : 1 incorrect
(1) : 2 incorrect
(0.5) : 3 incorrect

(b) Sketch the graph for this equation, labelling any intercepts and asymptotes clearly. **2**

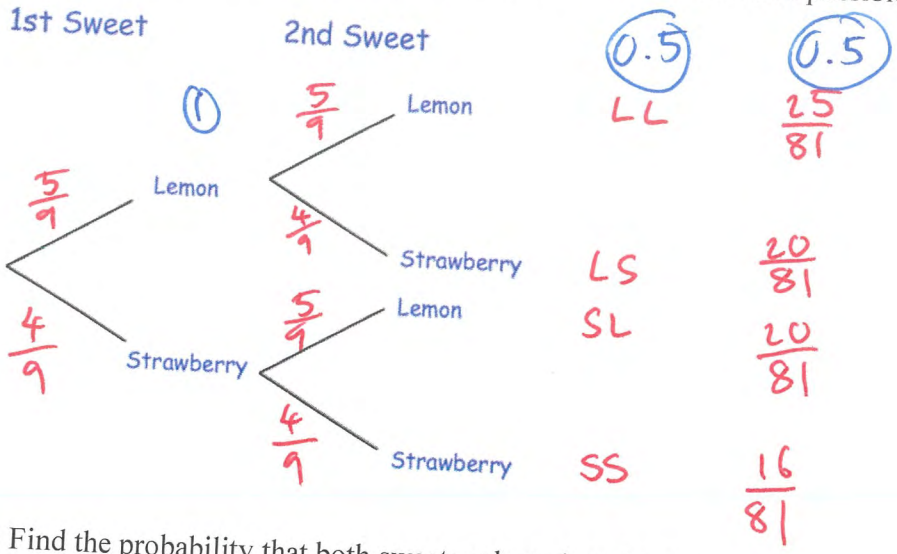


(0.5) correct points
(0.5) correct curve with arrows

Question 19 (5 marks)

There are 5 lemon and 4 strawberry sweets in a bag. Hailey takes out a sweet at random, writes down its flavour and puts it back into the bag. Then Hailey takes out a second sweet, at random, and writes down its flavour.

(a) Complete the probability tree diagram and include a list of all possible outcomes. **2**



(b) Find the probability that both sweets selected are lemon. **1**

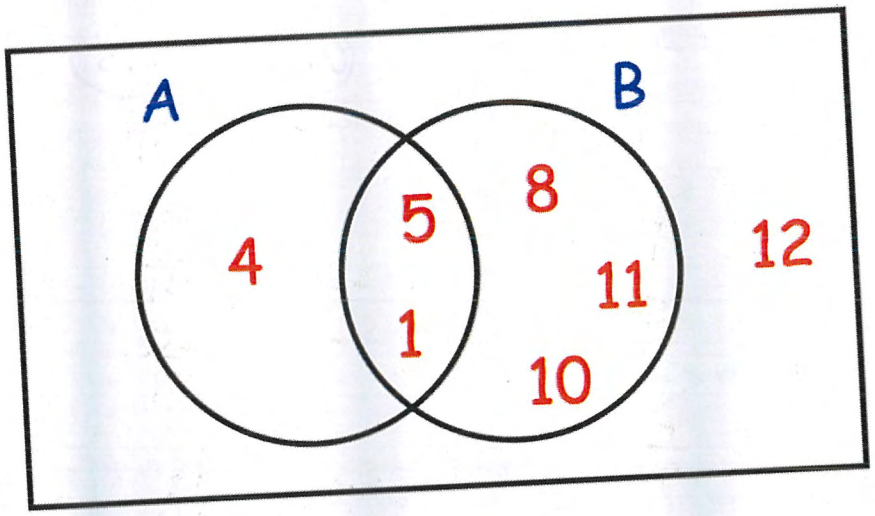
$P(LL) = \frac{25}{81}$ (1)

(c) Find the probability that a lemon and strawberry sweet are selected. **2**

$P(LS) = \frac{20}{81} + \frac{20}{81} = \frac{40}{81}$ (1) (1)

Question 20 (3 marks)

Set A is a list of Sam's favourite single-digit numbers and Set B is the number of hours that some students spent revising for their maths test. This has been represented in the below Venn Diagram:



(a) Find $P(A)$ 1

$P(A) = \frac{3}{7}$ (1)

(b) Find $P(A \cap \bar{B})$ 1

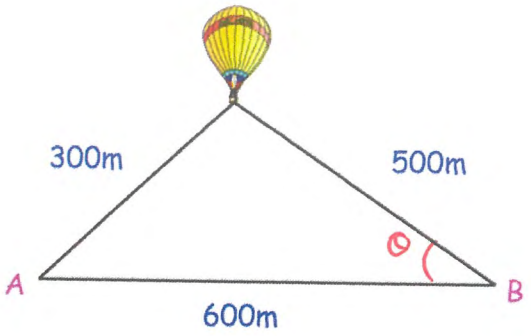
$P(A \cap \bar{B}) = \frac{1}{7}$ (1)

(c) Find $P(B|A)$ 1

$P(B|A) = \frac{2}{3}$ (1)

Question 21 (4 marks)

A hot air balloon is flying above two points on the ground at point A and point B, which are 600m apart. The hot air balloon is 300m from A and 500m from B.



(Potentially useful formulas:)

$$A = \frac{1}{2}ab\sin C$$

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$c^2 = a^2 + b^2 - 2ab\cos C$$

$$\cos C = \frac{a^2 + b^2 - c^2}{2ab}$$

a) Work out the angle of elevation of the balloon from point B.
Round your angle to the nearest degree. **2**

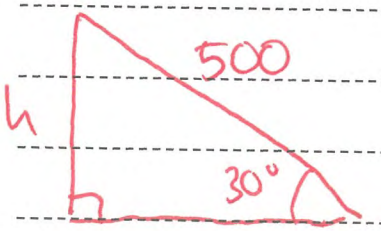
$\cos\theta = \frac{500^2 + 600^2 - 300^2}{2 \times 500 \times 600}$ (1)

$\cos\theta = 0.866...$

$\theta = \cos^{-1}(0.866...) = 29.926...°$ (0.5)

$\Rightarrow \theta = 30°$ (0.5)

b) By using your rounded answer from part a), calculate the height of the hot air balloon from the ground. Round your answer to the nearest metre if appropriate. **2**



$\sin 30 = \frac{h}{500}$ (1) FT

$h = 500 \sin 30$

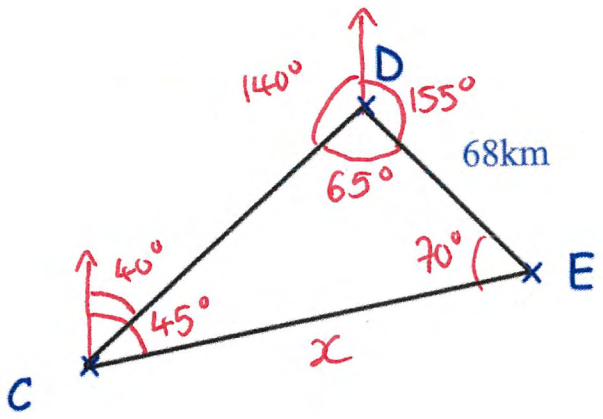
$h = 250\,m$ (1) FT

Dependent on previous answer.

Question 22 (3 marks)

Earlsfield (E) is on a bearing of 085° from Croydon (C) and on a bearing of 155° from Dorking (D). Dorking is on a bearing of 040° from Croydon. The distance between Dorking and Earlsfield is 68km.

Find the distance of Earlsfield from Croydon. Round your answer to the nearest metre. **3**



(Potentially useful formulas:)

$$A = \frac{1}{2}ab\sin C$$

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$c^2 = a^2 + b^2 - 2ab\cos C$$

$$\cos C = \frac{a^2 + b^2 - c^2}{2ab}$$

$\frac{x}{\sin 65} = \frac{68}{\sin 45}$ (1)

$x = \frac{68}{\sin 45} \times \sin 65$ (1)

$x = 87.156\,46796$ km (0.5)

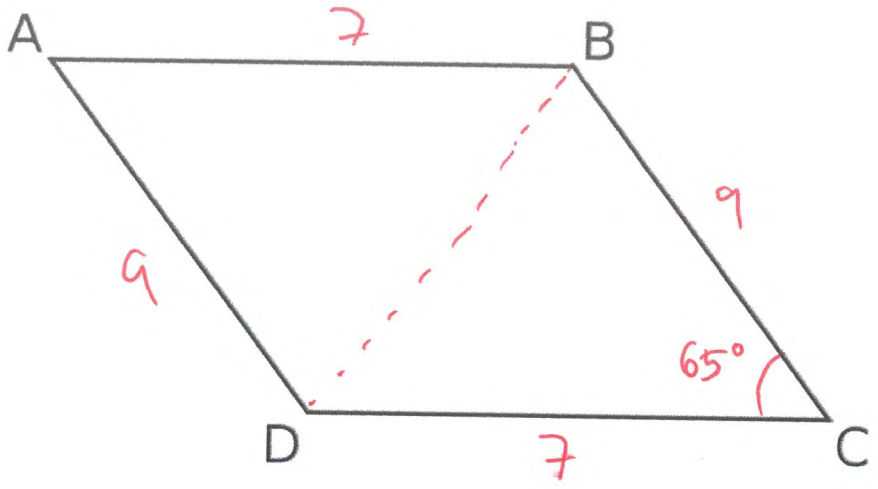
$x = 87.156$ km (0.5)

$(87\,156$ m$)$

Question 23 (3 marks)

Parallelogram ABCD has side lengths AB = 7cm and BC = 9cm. Angle BCD = 65°.

Find the area of this parallelogram. Round your answer to 1 decimal place. **3**



$A = \frac{1}{2}ab\sin C \times 2$ (2) (Or equivalent correct method)

$A = 7 \times 9 \times \sin 65$

$A = 57.09739058$ (0.5)

$A = 57.1\ cm^2$ (0.5)

END OF SECTION 3

SECTION 4

Question 24 (2 marks)

Solve $5^{2x+1} = 25$. **2**

$5^{2x+1} = 5^2$ (0.5)

$\Rightarrow 2x+1 = 2$ (0.5)

$2x = 1$

$x = \frac{1}{2}$ (1)

Question 25 (2 marks)

Calculate the length of MN. Round you answer to 2 decimal places. **2**

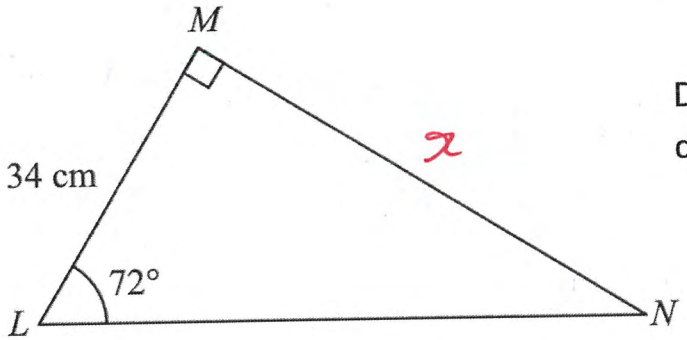


Diagram **NOT** drawn to scale

$\tan 72 = \frac{x}{34}$ (1)

$x = 34 \tan 72$ (0.5)

$x = 104.64$ cm (2 d.p.)

(0.5)

Question 26 (3 marks)

Solve $\log_3(x+1) - \log_3(x-2) = \log_3(5)$ **3**

$\log_3(x+1) - \log_3(x-2) = \log_3(5)$

$\log_3\left(\frac{x+1}{x-2}\right) = \log_3(5)$ (1)

$\frac{x+1}{x-2} = 5$ (1)

$x+1 = 5x-10$

$11 = 4x \qquad x = \frac{11}{4}$ (1)

Question 27 (3 marks)

Consider the quadratic function $y = x^2 + 4x - 5$.

(a) By completing the square, express $y = x^2 + 4x - 5$ in the form $y = (x+h)^2 + k$, where h and k are integers. **2**

$y = x^2 + 4x - 5$

$y = (x+2)^2 - 2^2 - 5$ (1)

$y = (x+2)^2 - 9$ (1)

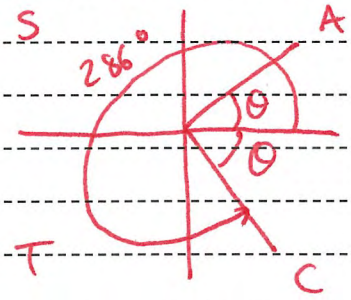
(b) State the coordinates of the vertex of $y = x^2 + 4x - 5$ **1**

$(-2, -9)$

0.5 0.5

Question 28 (3 marks)

a) If θ is acute, find the value of θ in $cos\theta = \cos 286°$ **1**



$0 \leq \theta < 90°$

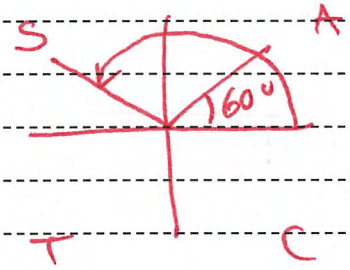
$\theta = 360 - 286$ (0.5)

$\theta \approx 74°$ (0.5)

b) If $0° \leq \theta \leq 360°$, then find the two values of θ that satisfies the equation: **2**

$$sin\theta = \frac{\sqrt{3}}{2}$$

$\theta_1 = \sin^{-1}\left(\frac{\sqrt{3}}{2}\right) = 60°$ (1)



$\theta_2 = 180 - 60$

$= 120°$ (1)

$\Rightarrow \theta = 60°, 120°$

Question 29 (6 marks)

Point A has coordinates $(2, 3)$ and point B has coordinates $(-4, 7)$.

(a) Find the midpoint of the line AB. **2**

$AB = \left(\frac{2+-4}{2}, \frac{3+7}{2}\right) = (-1, 5)$ (1) (1)

(b) Find the gradient of the line AB. **All working must be shown clearly.** **2**

$m_{AB} = \frac{7-3}{-4-2} = \frac{4}{-6} \therefore m_{AB} = -\frac{2}{3}$ (1) (1)

OR: $\frac{3-7}{2-(-4)} = \frac{-4}{6}$

(c) Show that the equation of line AB is $y = -\frac{2x}{3} + \frac{13}{3}$ **2**

$y = mx + b$ (c)

(0.5) $y = -\frac{2}{3}x + b \quad (2, 3)$

(0.5) $3 = -\frac{2}{3}(2) + b$

$3 = -\frac{4}{3} + b$

$b = 3 + \frac{4}{3}$

(0.5) $b = \frac{9}{3} + \frac{4}{3} = \frac{13}{3} \quad \therefore y = -\frac{2}{3}x + \frac{13}{3}$ (0.5)

Question 30 (4 marks)

Consider the function $f(x) = \frac{4x}{5} + 3$

(a) Determine the equation of $f^{-1}(x)$ 2

$y = \frac{4x}{5} + 3$

$x = \frac{4y}{5} + 3$ (0.5)

$x - 3 = \frac{4y}{5}$ (0.5)

$5x - 15 = 4y$

$y = \frac{5x - 15}{4}$ (0.5)

$\therefore f^{-1}(x) = \frac{5x - 15}{4}$ (0.5)

$\left(\frac{5(x-3)}{4}\right.$ fine too$\left.\right)$

(b) Find a simplified expression for $f(f(x))$ 2

$f(f(x)) = f\left(\frac{4x}{5} + 3\right)$ (0.5)

$= \frac{4}{5}\left(\frac{4x}{5} + 3\right) + 3$ (0.5)

$= \frac{16}{25}x + \frac{12}{5} + 3$ (0.5)

$= \frac{16x}{25} + \frac{27}{5}$ (0.5)

End of Paper