PENRITH SELECTIVE HIGH SCHOOL

MATHEMATICS DEPARTMENT

Assessment 4
Term 4 – 2022
Year 9 Mathematics

General Instructions:

- Reading time – 5 minutes
- Working time – 90 minutes
- Write using black or blue pen.
  Black pen is preferred.
  Pencil is only allowed for sketches.
- NESA approved calculators may be used.
- No correction tape/white out allowed.
- Students are allowed one A4 handwritten reference sheet.

Total marks – 78

- Attempt ALL questions.
- One mark for all multiple-choice questions.
- All necessary working should be shown in each question.

	Section 1	Section 2	Section 3	Section 4	Section 5	TOTAL
Functions	/15					/15
Trigonometry			/15		/7	/22
Quadratic Equations & Graphs		/17		/16		/33
Revision					/8	/8
TOTAL	/15	/17	/15	/16	/15	/78
						%

Student Name: _____ Teacher: _____

Section 1 – Functions (15 marks)

Multiple Choice: Questions 1 to 4 (Circle one letter.)

Q1) Which of the following set of ordered pairs does **NOT** represent a function?

A. {(1, 5), (2, 6), (3, 7), (4, 8), (5, 9)}

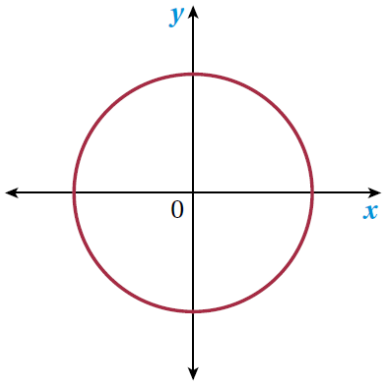
B. {(1, 1), (2, 2), (3, 3), (4, 4), (5, 5)}

C. {(1, 5), (2, 5), (3, 5), (4, 5), (5, 5)}

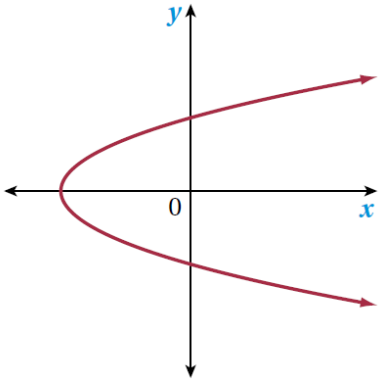
D. {(1, 1), (2, 4), (3, 9), (1, –1), (2, –4)}

Q2) Which one of the following graphs represents a function?

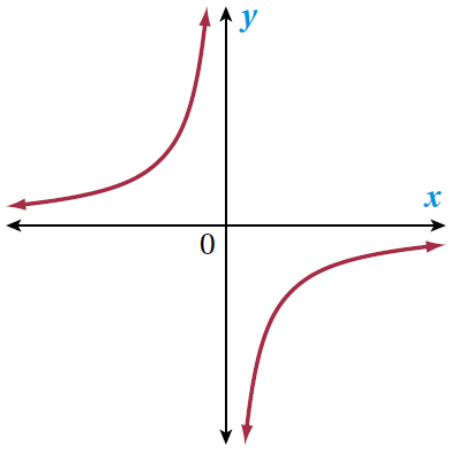
A.



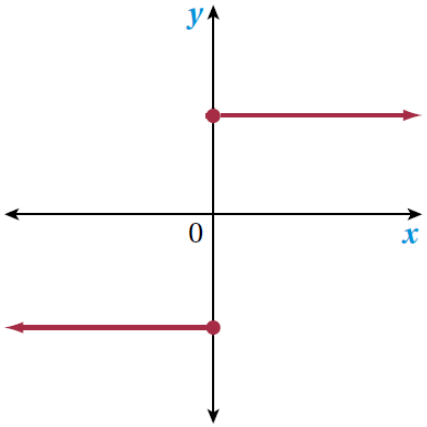
B.



C.



D.



Q3) An ordered pair consists of an *x* and a *y* coordinate.

The *x*-values of an ordered pair is known by different names.
Which of the following does **NOT** represent the *x*-values of a given relation?

A. domain B. input C. range D. independent variable

Q4) Which of the following represents the inverse function of $f(x) = 3x - 4$?

A. $f^{-1}(x) = \frac{x+4}{3}$

B. $f^{-1}(x) = \frac{x}{3} + 4$

C. $f^{-1}(x) = 4x - 3$

D. $f^{-1}(x) = \frac{x+3}{4}$

Q5) Consider the equation $y = 6x + 7$. **1**

Write this equation using function notation.

.....

Q6) A function ***f*** is given by the ordered pairs **(1, 9), (2, 8), (3, 7)**. **1**

Give the ordered pairs for its inverse function.

.....

Q7) Given $f(x) = 5x^2 + 2x - 1$, find and simplify the following.

a) $f(0)$ = **1**

b) $f(3)$ = **1**

c) $3f(x)$ = **1**

d) $f(3x)$ = **2**

=

e) $f(-x)$ = **1**

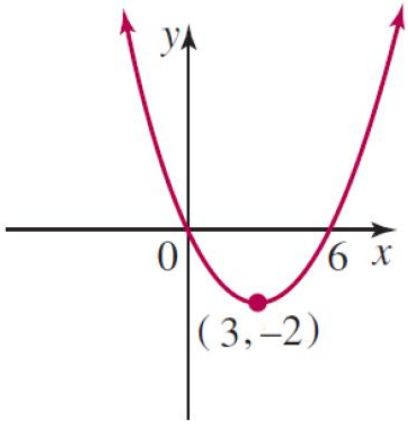
Q8) Not all lines are functions. One example is a vertical line. **1**

Explain why a vertical line is **NOT** a function.

……

……

Q9) Find the domain (permissible *x*–values) and range (permissible *y*–values) of the given graph. **2**



Section 2 – Quadratic Equations & Graphs (17 marks)

Multiple Choice: Questions 1 to 3 (Circle one letter.)

Q1) Which of the following quadratic equations is written in standard form?

A. $x^2 + 2x - 48 = 0$

B. $x^2 + 2(x - 24) = 0$

C. $x^2 + 2x = 48$

D. $(x+1)^2 = 49$

Q2) The coordinate (2, 3) is a point on which parabola?

A. $y = x^2 - 2x + 1$

B. $y = x^2 - 7$

C. $y = x^2 - x + 1$

D. $y = x^2 + x - 10$

Q3) Rupa solved the equation $x^2 - 3x + 2 = 1$ as follows:

$$x^2 - 3x + 2 = 1$$
$$(x-2)(x-1) = 1$$
$$x - 2 = 1 \text{ or } x - 1 = 1$$
$$x = 3 \text{ or } x = 2$$

What mistake has been committed?

A. Rupa did not make any mistake.

B. Rupa did not apply the Null Factor Law.

C. Rupa factorised the LHS of the equation incorrectly.

D. Rupa did not write $x = \pm 3$ or $x = \pm 2$.

Q4) Consider the quadratic equation $x^2 + 16 = 0$. **1**

Explain why there are no solutions to this equation.

……

……

Q5) Solve the following quadratic equations:

a) $2x^2 = 98$ **2**

b) $x^2 + 6x + 5 = 0$ **2**

c) $x^2 - 7x - 60 = 0$ **3**

d) $36 = -20x - x^2$ **3**

Q6) Solve for x: **3**

$2x^2 + 9x - 18 = 0$

Section 3 – Trigonometry (15 marks)

Multiple Choice: Questions 1 to 4 (Circle one letter.)

Q1) Using your calculator, which of the following represents the value of **sin 45° + cos 30° + tan 60°** to 1 decimal place?

A. 1.3 B. 3.3 C. 1.6 D. 3.6

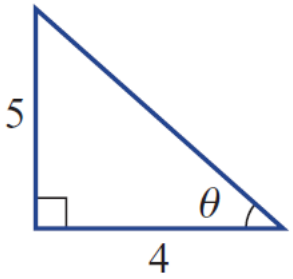
Q2) For the triangle shown, which calculation would you choose to solve for θ?

A. $\sin\theta = \frac{\text{O}}{\text{H}}$

B. $\cos\theta = \frac{\text{A}}{\text{H}}$

C. $\tan\theta = \frac{\text{O}}{\text{A}}$

D. $a^2 + b^2 = c^2$



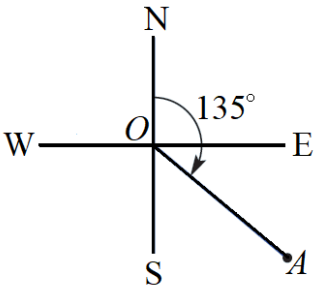
Q3) The bearing of *A* from *O* is 135°. What is the bearing of *O* from *A*?

A. 045°

B. 135°

C. 225°

D. 315°



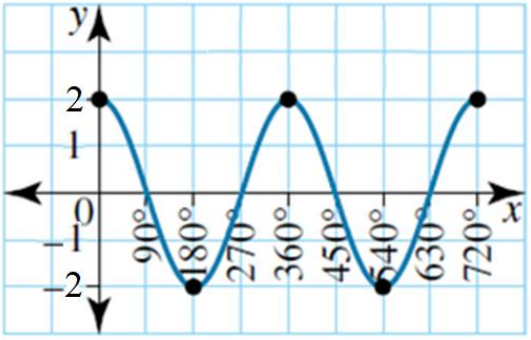
Q4) Which of the following is the equation of the trigonometric graph shown?

A. $y = 2\sin x$

B. $y = 2\cos x$

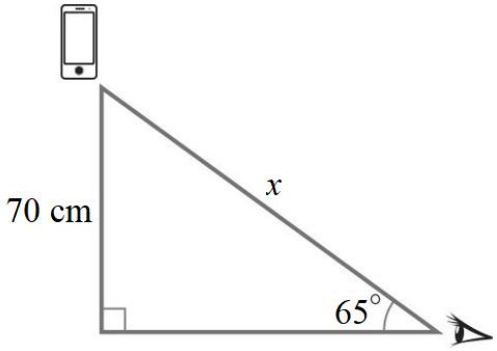
C. $y = 2\tan x$

D. $y = -2\sin x$

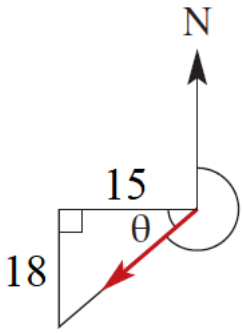


Q5) Having some trouble with her smartphone reception, Elena holds her smartphone up. The angle of elevation between her eye and the smartphone is 65°, and the height is as shown in the diagram below. **2**

Calculate the distance that the phone is now away from her eye. Write your answer to the nearest centimetre.



Q6) Clayton cycled for 15 km west and then 18 km south.

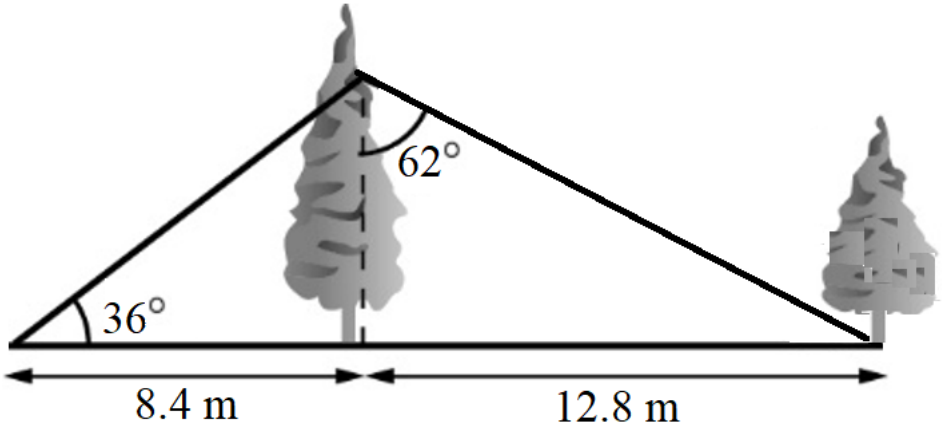


a) What is the value of θ to the nearest degree? **2**

b) What is Clayton's true bearing from his starting point? **2**

Q7) Lights are attached to two cables which are strung through two trees. The first cable makes an angle of 36° from the ground to the first tree. The second cable makes an angle of 62° from first tree to the second tree, as shown in the diagram. **5**

If there is no cable along the ground, find the length of the cable to the nearest tenth of a metre.



Section 4 – Quadratic Equations & Graphs (16 marks)

Multiple Choice: Questions 1 to 3 (Circle one letter.)

Q1) The transformation of the graph of $y = x^2$ to $y = (x+2)^2$ is described by a:

A. translation of 2 units up

B. translation of 2 units down

C. translation of 2 units to the left

D. translation of 2 units to the right

Q2) What is the relationship between solving a quadratic equation (e.g. $x^2 - 4x = 0$) and the graph of a parabola (e.g. $y = x^2 - 4x$)?

A. The solutions to a quadratic equation represent the *x*-intercepts of the parabola.

B. The solutions to a quadratic equation represent the *x*-coordinate of the vertex of the parabola.

C. The solutions to a quadratic equation represent the *y*-intercepts of the parabola.

D. Solving a quadratic equation has no bearing on the graph of a parabola.

Q3) Which of the following is always true about the graph of a parabola with equation $y = ax^2 + bx + c$?

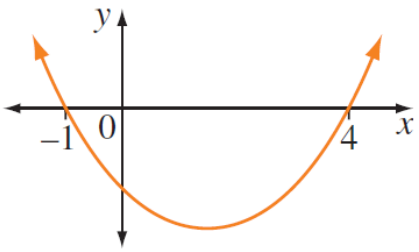
A. A parabola always contains two *x*-intercepts.

B. A parabola is always upright or concave up.

C. A parabola appears wider than $y = x^2$ when $a > 1$.

D. A parabola always contains one *y*-intercept.

Q4) For the given graph below, write the **equation** of the axis of symmetry. **1**



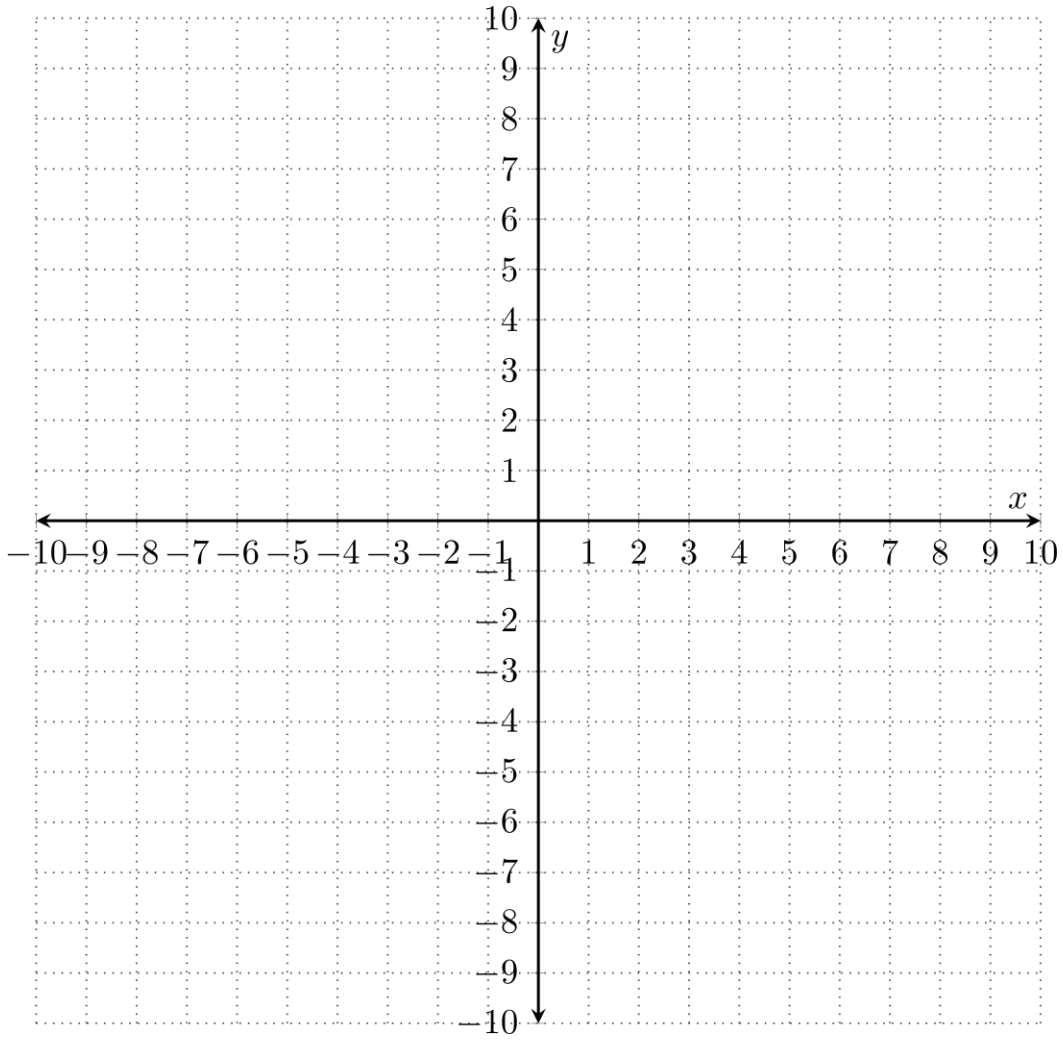
Q5) For the quadratic equation $y = x^2 - 2x - 8$:

a) find the *y*-intercept **1**

b) find the *x*-intercepts **2**

c) find the turning point **2**

d) sketch the graph below clearly showing the above key features **2**



Q6) Lily has a square patio. After expanding the length by 1.5 metres and the width by half a metre, the area became 20 m^2. **3**

Let x be the original side length of the patio.

Establish a quadratic equation and calculate the original area of the patio.

Q7) If x is an integer, what is the smallest value of the expression $x^2 - 6x - 16$? **2**

Section 5 – Revision & Trigonometry (15 marks)

Multiple Choice: Questions 1 to 4 (Circle one letter.)

Q1) Which of the following is equivalent to $\frac{3}{\sqrt{3}}$?

A. $3\sqrt{3}$ B. $\sqrt{3}$

C. $\frac{\sqrt{3}}{3}$ D. $\frac{1}{3}$

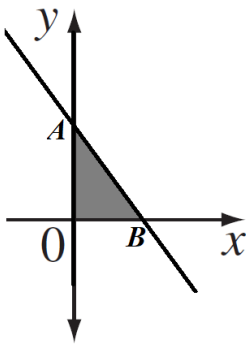
Q2) Simplify $\frac{a^2}{a-2}+\frac{4}{2-a}$.

A. $\frac{a^2+4}{a-2}$ B. $\frac{a^2+4}{a^2-4}$

C. $a-2$ D. $a+2$

Q3) In the figure, the equation of line AB is $y=-\frac{5}{3}x+10$.

What is the area of the shaded portion in square units?



A. 12

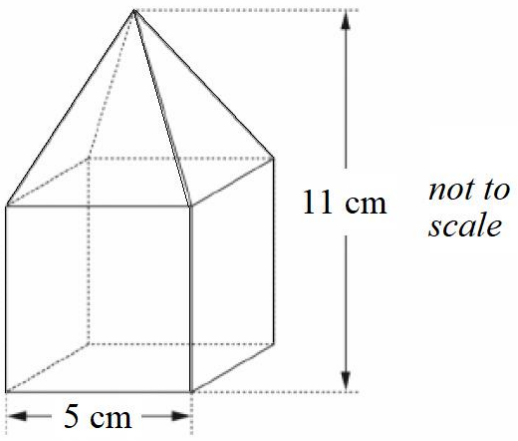
B. 30

C. 60

D. 100

Q4) A square pyramid fits exactly on top of a cube to form a solid.

What is the volume of this solid?



A. 175 cm^3

B. 217 cm^3

C. 225 cm^3

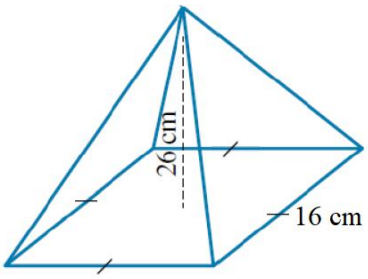
D. 275 cm^3

Q5) Each interior angle of a regular polygon is 165°. How many sides does this polygon have? **2**

Q6) Calculate the compound interest when $5000 is invested at 8% p.a. over 3 years compounding quarterly. **2**

Q7) In the square pyramid shown, the side length of the square is 16 cm, and the height of the pyramid is 26 cm.

Calculate the following:



a) the angle the triangular face makes with the base (to the nearest degree) **2**

b) the angle the sloping edge makes with the base (to the nearest degree) **3**

c) the length of the sloping edge (to the nearest centimetre) **2**

End of Paper

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MATHEMATICS DEPARTMENT

Assessment 4
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Year 9 Mathematics

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Total marks – 78

- Attempt ALL questions.
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	Section 1	Section 2	Section 3	Section 4	Section 5	TOTAL
Functions	/15					/15
Trigonometry			/15		Q7 /7	/22
Quadratic Equations & Graphs		/17		/16		/33
Revision					/8	/8
TOTAL	/15	/17	/15	/16	/15	/78
						%

Student Name: Correct Answers Teacher: Mr Solution

Section 1 – Functions (15 marks)

Multiple Choice: Questions 1 to 4 (Circle one letter.)

Q1) Which of the following set of ordered pairs does **NOT** represent a function?

A. {(1, 5), (2, 6), (3, 7), (4, 8), (5, 9)}

B. {(1, 1), (2, 2), (3, 3), (4, 4), (5, 5)}

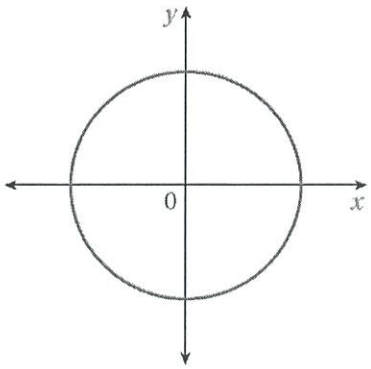
C. {(1, 5), (2, 5), (3, 5), (4, 5), (5, 5)}

(D.) {(1, 1), (2, 4), (3, 9), (1, –1), (2, –4)}

Done well

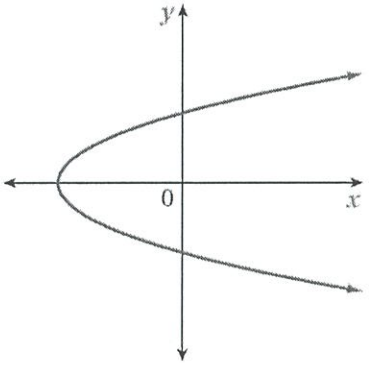
Q2) Which one of the following graphs represents a function?

A.

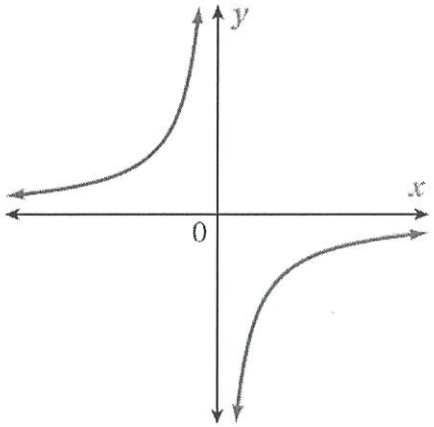


Done well

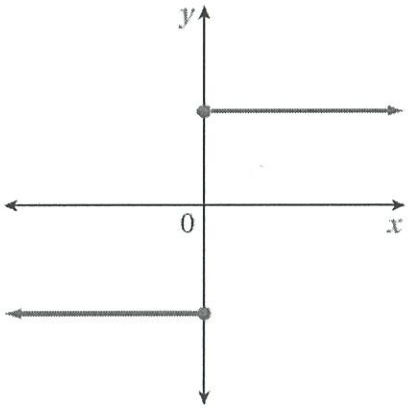
B.



(C.)



D.



Q3) An ordered pair consists of an x and a y coordinate.

The x-values of an ordered pair is known by different names.
Which of the following does **NOT** represent the x-values of a given relation?

A. domain B. input (C.) range D. independent variable

Done well

Q4) Which of the following represents the inverse function of $f(x)=3x-4$?

A. $f^{-1}(x)=\frac{x+4}{3}$ B. $f^{-1}(x)=\frac{x}{3}+4$

C. $f^{-1}(x)=4x-3$ D. $f^{-1}(x)=\frac{x+3}{4}$

Q5) Consider the equation $y=6x+7$. 1

Write this equation using function notation.

$f(x)=6x+7$ Not done well.

Q6) A function f is given by the ordered pairs **(1, 9), (2, 8), (3, 7).** 1

Give the ordered pairs for its inverse function.

$(9,1),(8,2),(7,3)$ Mostly done well.

Q7) Given $f(x)=5x^2+2x-1$, find and simplify the following.

a) $f(0) = 5(0)^2+2(0)-1 = -1$ Done well 1

b) $f(3) = 5(3)^2+2(3)-1 = 50$ Done well. 1

c) $3f(x) = 15x^2+6x-3$ Students did not do $3(5x^2+2x-1)$ correctly. 1

d) $f(3x) = 5(3x)^2+2(3x)-1$ $3x^2 \neq (3x)^2$ 2

Not done well. $= 45x^2+6x-1$

e) $f(-x) = 5(-x)^2+2(-x)-1$ Some students did not simplify. 1

$= 5x^2-2x-1$

Q8) Not all lines are functions. One example is a vertical line. **1**

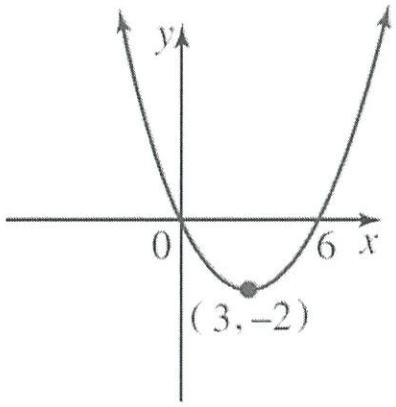
Explain why a vertical line is **NOT** a function.

A vertical line fails the vertical line test.

or For any x-value of a vertical line, it consists multiple y-values.

Mostly done well.

Q9) Find the domain (permissible x–values) and range (permissible y–values) of the given graph. **2**



Domain: all real numbers

Range: $y \geq -2$

Domain was answered well but range students did not do well answering for all the permissible y-values.

Section 2 – Quadratic Equations & Graphs (17 marks)

Multiple Choice: Questions 1 to 3 (Circle one letter.)

Q1) Which of the following quadratic equations is written in standard form?

(A.) $x^2+2x-48=0$ B. $x^2+2(x-24)=0$

C. $x^2+2x=48$ D. $(x+1)^2=49$

Q2) The coordinate (2, 3) is a point on which parabola?

A. $y=x^2-2x+1$ B. $y=x^2-7$

(C.) $y=x^2-x+1$ D. $y=x^2+x-10$

Q3) Rupa solved the equation $x^2-3x+2=1$ as follows:

$$x^2-3x+2=1$$
$$(x-2)(x-1)=1$$
$$x-2=1 \text{ or } x-1=1$$
$$x=3 \text{ or } x=2$$

What mistake has been committed?

A. Rupa did not make any mistake.

(B.) Rupa did not apply the Null Factor Law.

C. Rupa factorised the LHS of the equation incorrectly.

D. Rupa did not write $x=\pm 3$ or $x=\pm 2$.

Q4) Consider the quadratic equation $x^2+16=0$. 1

Explain why there are no solutions to this equation.

If $x^2+16=0$, then it follows that $x^2=-16$. Since x^2 will always be positive, then there will be no solution for this equation.

OR The smallest value that x^2 can be is zero, so $0+16\neq 0$, so there'll be no solutions.

Q5) Solve the following quadratic equations:

a) $2x^2 = 98$ (2)

$x^2 = 49$

$x = \pm 7$

Alternative Soln

$2x^2 - 98 = 0$

$2(x^2 - 49) = 0$

$2(x+7)(x-7) = 0$

$\therefore x = -7$ or $x = 7$ (1) (1)

b) $x^2 + 6x + 5 = 0$ (2)

$(x+5)(x+1) = 0$

$x+5=0 \mid x+1=0$

$x = -5 \mid x = -1$ (1) (1)

c) $x^2 - 7x - 60 = 0$ (3)

$(x-12)(x+5) = 0$

$x-12=0 \mid x+5=0$

$x = 12 \mid x = -5$ (1) (1)

d) $36 = -20x - x^2$ (3)

$x^2 + 20x + 36 = 0$

$(x+18)(x+2) = 0$ (1)

$x+18=0 \mid x+2=0$

$x = -18 \mid x = -2$ (1) (1)

Q6) Solve for x: (3)

$2x^2 + 9x - 18 = 0$

$2x^2 + 12x - 3x - 18 = 0$

$2x(x+6) - 3(x+6) = 0$

$(x+6)(2x-3) = 0$ (1)

$x+6=0 \mid 2x-3=0$

$x = -6 \mid x = \frac{3}{2}$ (1) (1)

Section 3 – Trigonometry (15 marks)

Multiple Choice: Questions 1 to 4 (Circle one letter.)

Q1) Using your calculator, which of the following represents the value of **sin 45° + cos 30° + tan 60°** to 1 decimal place?

A. 1.3 ✓ (B.) 3.3 C. 1.6 D. 3.6

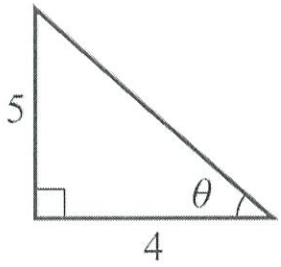
Q2) For the triangle shown, which calculation would you choose to solve for θ?

A. $\sin\theta = \frac{O}{H}$

B. $\cos\theta = \frac{A}{H}$

✓ (C.) $\tan\theta = \frac{O}{A}$

D. $a^2 + b^2 = c^2$



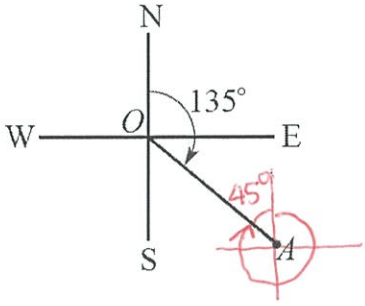
Q3) The bearing of A from O is 135°. What is the bearing of O from A?

A. 045°

B. 135°

C. 225°

✓ (D.) 315°



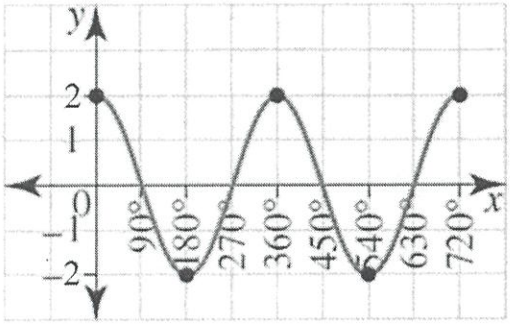
Q4) Which of the following is the equation of the trigonometric graph shown?

A. $y = 2\sin x$

✓ (B.) $y = 2\cos x$

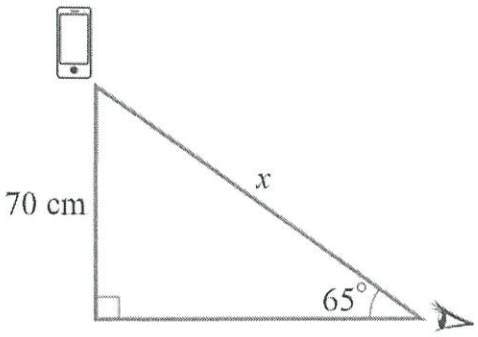
C. $y = 2\tan x$

D. $y = -2\sin x$



Q5) Having some trouble with her smartphone reception, Elena holds her smartphone up. The angle of elevation between her eye and the smartphone is 65°, and the height is as shown in the diagram below. **2**

Calculate the distance that the phone is now away from her eye. Write your answer to the nearest centimetre.



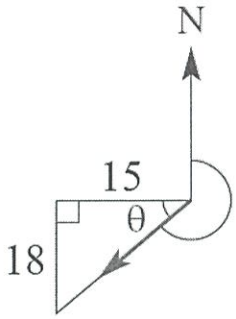
$\sin 65° = \frac{70}{x}$ ✓

$x = \frac{70}{\sin 65°}$

$x = 77.23645...$

$\therefore x = 77$ cm ✓

Q6) Clayton cycled for 15 km west and then 18 km south.



a) What is the value of θ to the nearest degree? **2**

$\tan\theta = \frac{18}{15}$ ✓

$\theta = 50.1944...$

$\therefore \theta = 50°$ ✓

b) What is Clayton's true bearing from his starting point? **2**

$270° - 50° = 220°$ ✓ ✓

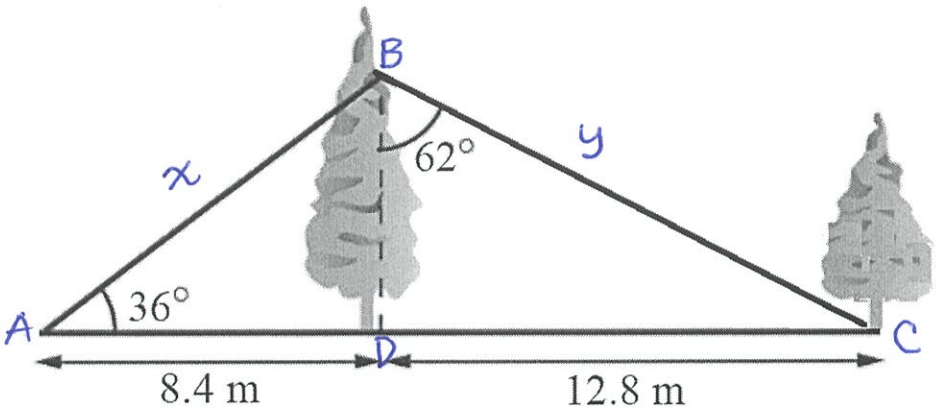
Clayton's true bearing is 220° or 220°T.

(Solution required)

No marks awarded for 040°, 270°, 310°

Q7) Lights are attached to two cables which are strung through two trees. The first cable makes an angle of 36° from the ground to the first tree. The second cable makes an angle of 62° from first tree to the second tree, as shown in the diagram. **5**

If there is no cable along the ground, find the length of the cable to the nearest tenth of a metre.



In $\triangle ABD$:

$\cos 36° = \frac{8.4}{x}$ ✓

$x = \frac{8.4}{\cos 36°}$ ✓

$x = 10.38297...$

In $\triangle CBD$:

$\sin 62° = \frac{12.8}{y}$ ✓

$y = \frac{12.8}{\sin 62°}$ ✓

$y = 14.49689...$

∴ length of cable $= x + y$

$= 10.38297... + 14.49689...$

✓ $= 24.9$ m (nearest tenth)

(Incorrect rounding for this question will lose 1 mark.)

Section 4 – Quadratic Equations & Graphs (16 marks)

Multiple Choice: Questions 1 to 3 (Circle one letter.)

Q1) The transformation of the graph of $y = x^2$ to $y = (x+2)^2$ is described by a:

A. translation of 2 units up

B. translation of 2 units down

C. translation of 2 units to the left

D. translation of 2 units to the right

Q2) What is the relationship between solving a quadratic equation (e.g. $x^2 - 4x = 0$) and the graph of a parabola (e.g. $y = x^2 - 4x$)?

A. The solutions to a quadratic equation represent the x-intercepts of the parabola.

B. The solutions to a quadratic equation represent the x-coordinate of the vertex of the parabola.

C. The solutions to a quadratic equation represent the y-intercepts of the parabola.

D. Solving a quadratic equation has no bearing on the graph of a parabola.

Q3) Which of the following is always true about the graph of a parabola with equation $y = ax^2 + bx + c$?

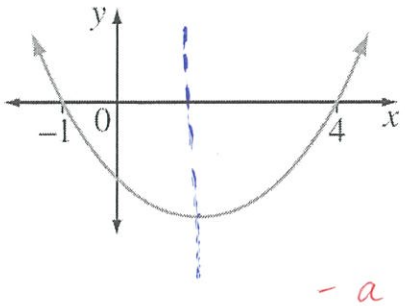
A. A parabola always contains two x-intercepts.

B. A parabola is always upright or concave up.

C. A parabola appears wider than $y = x^2$ when $a > 1$.

D. A parabola always contains one y-intercept.

Q4) For the given graph below, write the **equation** of the axis of symmetry. **1**



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

$x = \frac{3}{2}$ or $x = 1.5$

- a significant number of students did not write $x =$. It is an equation.
- You must also specify $x =$, as opposed to 'axis of symmetry =', because how else am I meant to know it isn't $y =$? (horizontal)

Q5) For the quadratic equation $y = x^2 - 2x - 8$:

a) find the y-intercept **1**

When $x = 0$, $y = -8$

$\therefore$ y-intercept is -8.

Done well

b) find the x-intercepts **2**

when $y = 0$, $x^2 - 2x - 8 = 0$

$(x-4)(x+2) = 0$ ✓

$x = 4, -2$

$\therefore$ x-intercepts are 4 and -2. ✓

Done well. Incorrect factorisation could still result in 1 mark for intercepts if equation is solved correctly.

c) find the turning point **2**

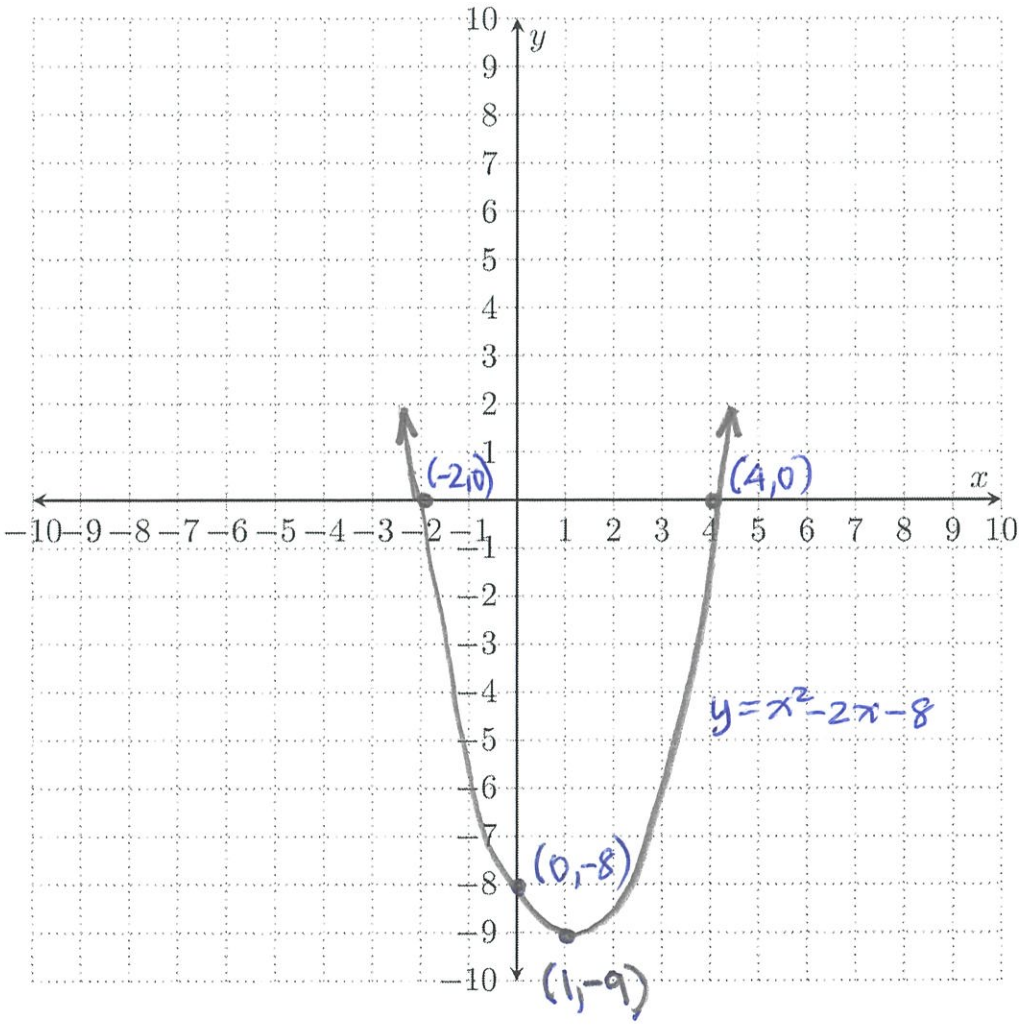
$x = \frac{4-2}{2} = 1$

$y = 1^2 - 2(1) - 8 = -9$ ✓

$\therefore$ turning point is $(1, -9)$ ✓

Done quite well. There was a number of students who did not answer with coordinates, it is a point. i.e. $(1, -9)$

d) sketch the graph below clearly showing the above key features **2**



1 for shape

1 for features.

Some students lost a mark for not CLEARLY showing the features.

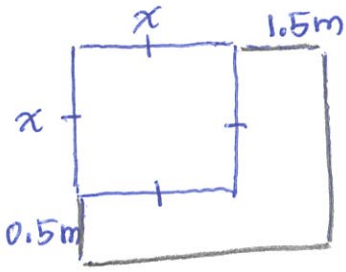
↳ provide coordinates.

overall done well.

Q6) Lily has a square patio. After expanding the length by 1.5 metres and the width by half a metre, the area became 20 m^2. **3**

Let x be the original side length of the patio.

Establish a quadratic equation and calculate the original area of the patio.



$(x+1.5)(x+0.5) = 20$ ✓

$x^2 + 0.5x + 1.5x + 0.75 = 20$

$x^2 + 2x - 19.25 = 0$

$(x+5.5)(x-3.5) = 0$

$x = -5.5, \quad x = 3.5$ ✓

but $x > 0$, since x is a side length

$\therefore x = 3.5\text{ m}$

$\therefore \text{Area} = (3.5\text{ m})^2$

$= 12.25\text{ m}^2$ ✓

- most students got at least 1 mark.
- guess and check to find $x = 3.5$ was only enough for 2/3. For full marks you needed to solve the quadratic to find $x = -5.5$ or 3.5.
- Students are encouraged to ensure they answer the question. A few students found $x = 3.5$ but did not go on to find the area.

Q7) If x is an integer, what is the smallest value of the expression $x^2 - 6x - 16$? **2**

let $y = x^2 - 6x - 16$

$y = (x-8)(x+2)$ ✓

x-intercepts are 8 and -2

axis of symmetry: $x = \frac{8-2}{2}, \quad x = 3$

$\therefore y = 3^2 - 6(3) - 16 = -25$

$\therefore$ smallest value of $x^2 - 6x - 16$ is -25. ✓

- most students found the x-intercepts.
- the question asks for the smallest value, i.e. the minimum of the expression, not of x.
  - many students answered with -2 as $-2 < 8$.

- students who understood what the question was asking did well.

Section 5 – Revision & Trigonometry (15 marks)

Multiple Choice: Questions 1 to 4 (Circle one letter.)

Q1) Which of the following is equivalent to $\frac{3}{\sqrt{3}}$?

A. $3\sqrt{3}$

B. $\sqrt{3}$

C. $\frac{\sqrt{3}}{3}$

D. $\frac{1}{3}$

$\frac{3}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = \frac{3\sqrt{3}}{3} = 3$

well done

Q2) Simplify $\frac{a^2}{a-2} + \frac{4}{2-a}$.

$= \frac{a^2}{a-2} - \frac{4}{a-2} = \frac{(a+2)(a-2)}{a-2} = a+2$

A. $\frac{a^2+4}{a-2}$

B. $\frac{a^2+4}{a^2-4}$

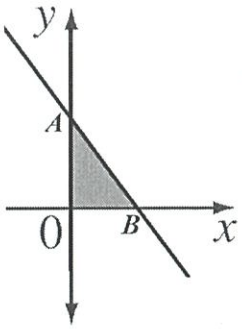
C. $a-2$

D. $a+2$

* Many students got this wrong
* students need to work on their algebraic skills

Q3) In the figure, the equation of line AB is $y = -\frac{5}{3}x + 10$.

What is the area of the shaded portion in square units?



* well done

if $x = 0$, $y = 10$

$\therefore$ A is at 10

if $y = 0$, $x = 6$

$\therefore$ B is at 6

Area $= \frac{10 \times 6}{2} = 30$

A. 12

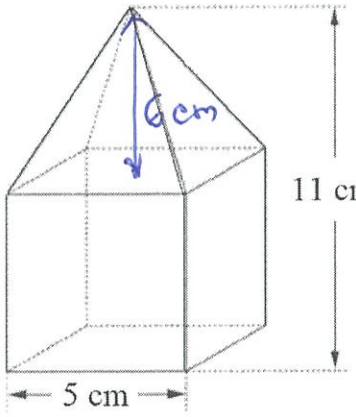
B. 30

C. 60

D. 100

Q4) A square pyramid fits exactly on top of a cube to form a solid.

What is the volume of this solid?



not to scale

* very few got this incorrect.

$V_{cube} = 5^3 = 125$

$V_{pyramid} = \frac{1}{3} \times 25 \times 6$

$= 50$

$\therefore$ Volume

$= 50 + 125$

$= 175 \text{ cm}^3$

A. 175 cm^3

B. 217 cm^3

C. 225 cm^3

D. 275 cm^3

Q5) Each interior angle of a regular polygon is 165°. How many sides does this polygon have? 2

exterior angle $= 180° - 165° = 15°$

number of sides $= \frac{360°}{15°} = 24$ sides

* the setting out of this question was not to standard.
* Very few did guess-and-check.

Q6) Calculate the compound interest when \$5000 is invested at 8% p.a. over 3 years compounding quarterly. 2

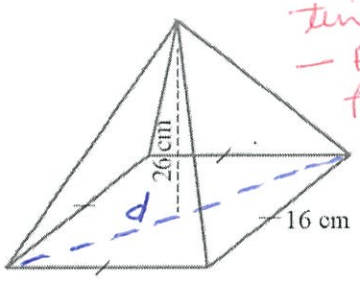
$A = 5000 \times \left(1 + \frac{0.08}{4}\right)^{4\times 3} = 5000 \times (1.02)^{12} = 6341.21$

$\therefore$ compound interest $= 6341.21 - 5000 = \$1341.21$

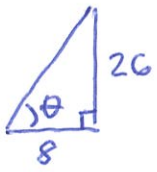
- some students wrote to divide 8% by 4 and/or multiply the time by 4
- Few students forgot to find compound interest

Q7) In the square pyramid shown, the side length of the square is 16 cm, and the height of the pyramid is 26 cm.

Calculate the following:



a) the angle the triangular face makes with the base (to the nearest degree) 2



$\tan\theta = \frac{26}{8}$

$\theta = 72.897...$

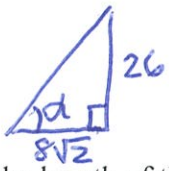
$\therefore \theta = 73°$

* Some students found $\theta = \tan^{-1}\frac{8}{26}$.
* Some students found other angle.

b) the angle the sloping edge makes with the base (to the nearest degree) 3

$d^2 = 16^2 + 16^2$ (Pythagoras' theorem)

$\therefore d = 16\sqrt{2}$



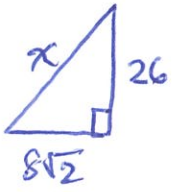
$\tan\alpha = \frac{26}{8\sqrt{2}}$

$\alpha = 66.484...$

$\therefore \alpha = 66°$

* Few students wrote $d^2 = 8^2 + 8^2$ instead.
- poor attempt.

c) the length of the sloping edge (to the nearest centimetre) 2



by Pythagoras' theorem

$x^2 = 26^2 + (8\sqrt{2})^2$

$x = \sqrt{804}$, $x > 0$

$\therefore x = 28.35489...$

$\therefore x = 28$ cm

* many students wrote 8 instead of $8\sqrt{2}$.
- okay.

End of Paper