EXAMINATIONS COUNCIL OF ESWATINI
Eswatini General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER			

MATHEMATICS **6880/04**

Paper 4 Structured Questions (Extended) **October/November 2024**

2 hours 30 minutes

Candidates answer on the Question Paper.

Additional Materials: Scientific calculator
Geometrical Instruments

READ THESE INSTRUCTIONS FIRST

Write your name, centre number and candidate number in the spaces provided.
Write in dark blue or black pen.
You may use a soft pencil for any diagrams, graphs or rough working.
Do **not** use staples, paper clips, highlighters, glue or correction fluid.

Answer **all** questions.

If working is needed for any question it must be shown below that question.
The number of marks is given in brackets [ ] at the end of each question **or** part question.

If the degree of accuracy is not specified in the question, and if the answer is not exact, give the answer to three significant figures.
Give answers in degrees to one decimal place.

For π, use your calculator value or 3.142.
The total of the marks for this paper is 120.

For Examiner's Use	
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Total	

This document consists of **15** printed pages and **1** blank page.

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1 **(a)** You are given that
$\mathscr{E}$ = {Prime numbers},
A = {Numbers less than 12},
B = {Factors of 60}.

(i) List members of A.

Answer (a)(i) ..... [1]

(ii) List members of $A \cap B$.

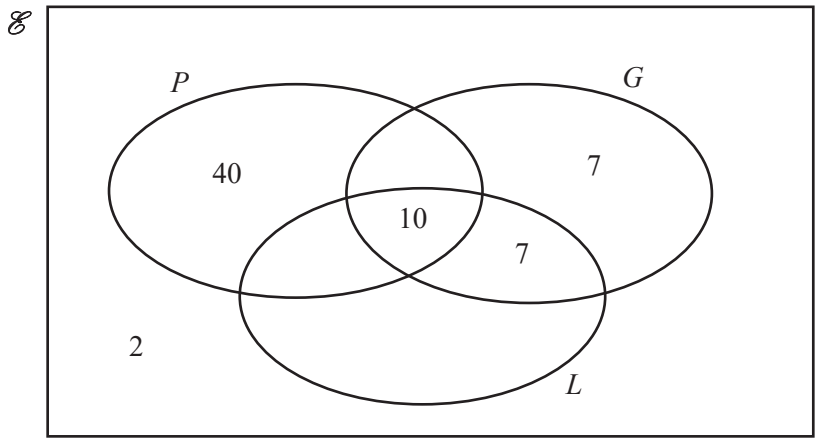
Answer (a)(ii) ..... [1]

(iii) Use set symbols to describe the relationship between set A and set B.

Answer (a)(iii)..... [1]

(b) A form 5 class has 160 students.
90 students take Physics.
60 students take Geography.
75 students take Literature.

The Venn diagram shows part of the information.
P = {Physics students}
G = {Geography students}
L = {Literature students}



(i) Complete the Venn diagram [3]

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(ii) Find the number of students who take exactly 2 subjects.

Answer (b)(ii) ..... [1]

(iii) Find the number of students who do **not** take Literature.

Answer (b)(iii) ..... [1]

(iv) Find $n((G \cup L)' \cap P)$.

Answer (b)(iv) ..... [1]

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2 The first four terms of a sequence are 7, 11, 15 and 19.

(a) State the rule for finding the next term of the sequence.

Answer (a) ..... [1]

(b) Find the 8th term of the sequence.

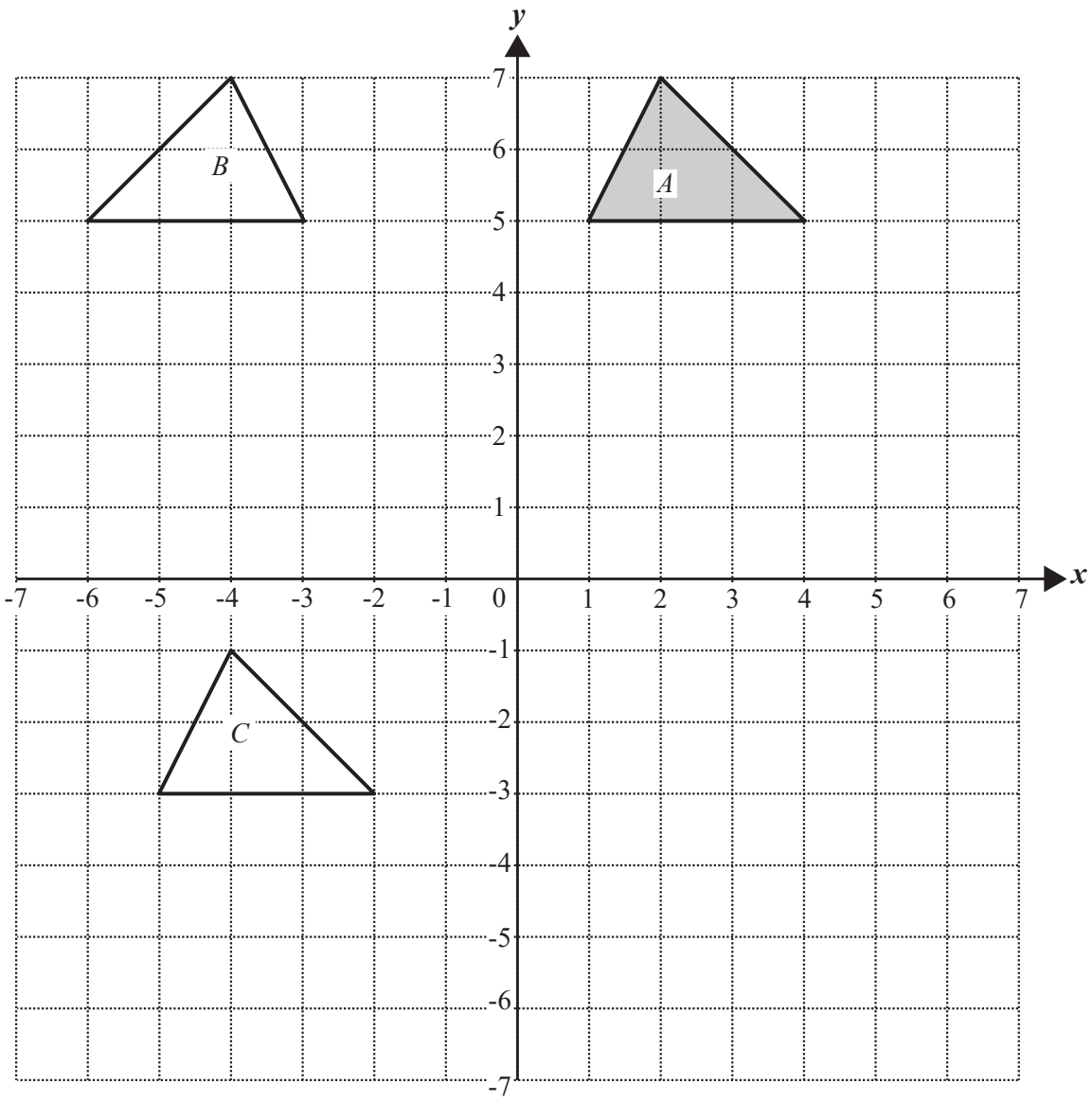
Answer (b) ..... [1]

(c) The nth term in the sequence is 51.

Find the value of n.

Answer (c) ..... [1]

3



(a) Describe fully the **single** transformation that maps

(i) triangle A onto triangle B,

..... [2]

(ii) triangle A onto triangle C.

..... [2]

(b) **(i)** Triangle A is transformed onto triangle D using matrix $\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$.

Draw triangle D on the grid above. [3]

(ii) Describe the transformation that is represented by $\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$.

.....

..... [3]

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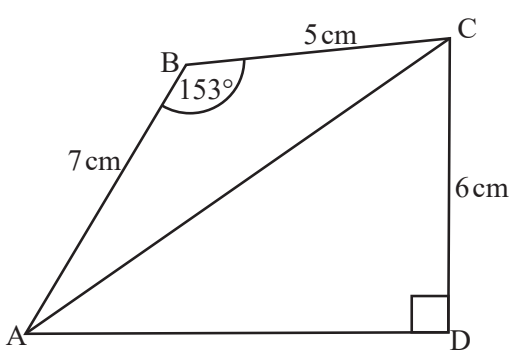
(c) Matrix V represents an enlargement with scale factor -2, centre (0 , 0).

Find matrix V.

Answer (c) ..... [2]

---

4 The diagram shows quadrilateral *ABCD*.



NOT TO SCALE

Calculate

(a) the length of *AC*,

Answer (a).....cm [4]

(b) angle *ACB*,

Answer (b).....° [3]

(c) angle *ACD*,

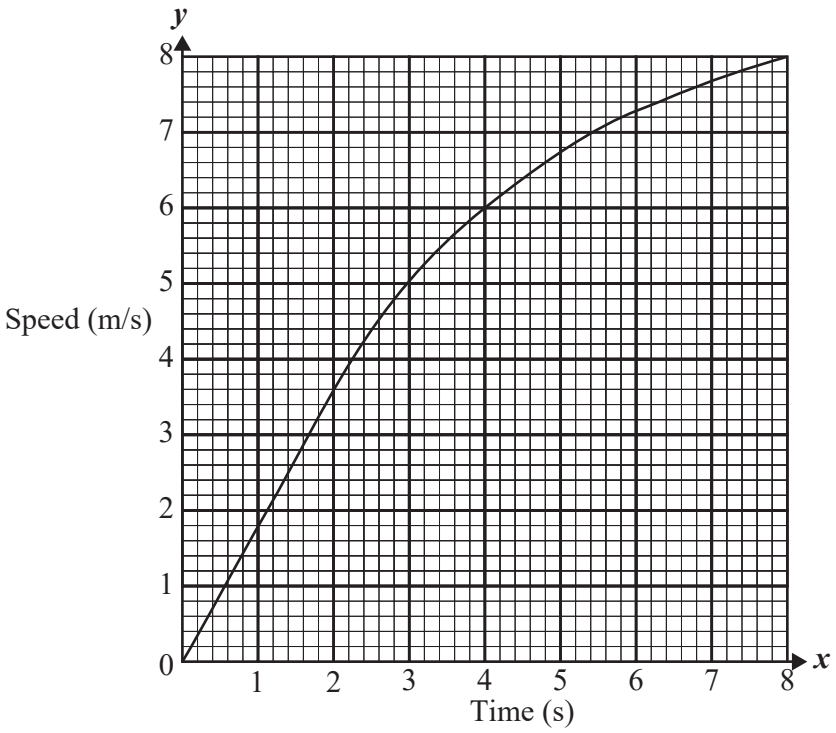
Answer (c)..... [2]

(d) angle *CAD*.

Answer (d)..... [1]

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5 The speed-time graph shows the journey of an athlete across a field.



(a) Find the speed of the athlete at $t = 5$ seconds.

Answer (a) .....m/s [1]

(b) Find the acceleration of the athlete at $t = 6$ seconds.

Answer (b) .....m/s^2 [3]

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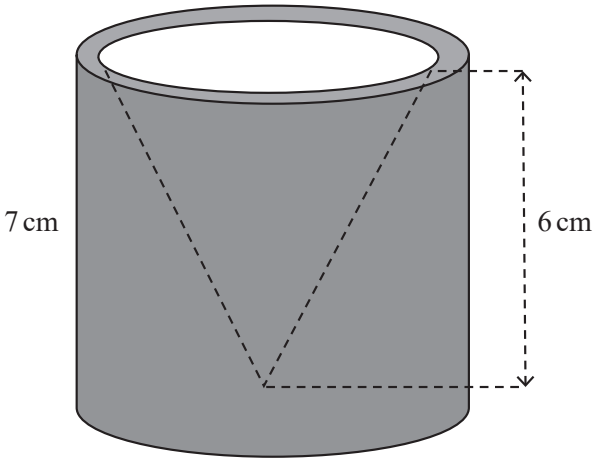
(c) Estimate the distance travelled in the first 2 seconds.

Answer (c) .....m [3]

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6 A solid is formed by removing a cone from a solid cylinder.
The radius of the cylinder is 3 cm.
The height of the cylinder is 7 cm.
The cone has a radius of 2.5 cm.
The vertical of height of the cone is 6 cm.

[curved surface area of a cone $= \pi rl$ and the volume of a cone $= \frac{1}{3}\pi r^2 h$]



NOT TO SCALE

Calculate

(a) the curved surface area of the cone,

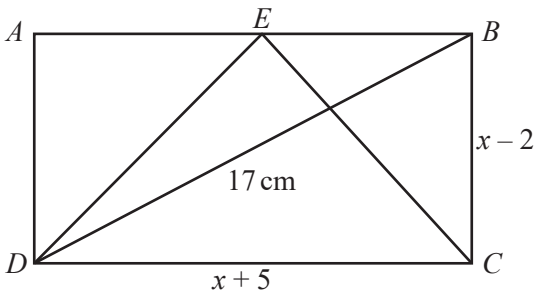
Answer (a) .....cm^2 [3]

(b) the volume of the solid material left.

Answer (b) ..... cm^3 [4]

---

7 The lengths of the sides of rectangle $ABCD$ are $(x + 5)$ cm and $(x - 2)$ cm.
The length of the diagonal is 17 cm.
Point E lies on the line AB.



NOT TO SCALE

(a) Form an equation and show that it reduces to $x^2 + 3x - 130 = 0$. [3]

(b) Use factorisation to solve $x^2 + 3x - 130 = 0$.

Answer (b) $x =$ ..... or $x =$ ..... [3]

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(c) Calculate the area of triangle *DEC*.

Answer (c) ..... cm^2 [3]

---

8 **(a)** Factorise.

(i) $8x^2 - 20x^3$

Answer (a)(i) ..... [2]

(ii) $\frac{4}{9} - 25x^2$

Answer (a)(ii)..... [2]

(b) **(i)** Rearrange $y = 4 + (x - 7)^3$ to make x the subject.

Answer (b)(i) $x =$ ..... [3]

(ii) You are given $g(x) = 4 + (x - 7)^3$.

Use your answer to **(b)(i)** to find $g^{-1}(x)$.

Answer (b)(ii) $g^{-1}(x) =$ ..... [1]

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(c) Expand $(2x - 3)(x + 1)(x + 3)$.

Answer (c) ..... [3]

(d) Simplify.

(i) $(2x)^4$

Answer (d)(i) ..... [1]

(ii) $\dfrac{8x^{\frac{3}{2}}y^2}{12x^{\frac{5}{2}}y}$

Answer (d)(ii) ..... [2]

---

9 **(a)** The equation of a curve is $y = 3x^3 - 3x^2 + 9$.

(i) Point $P(2\ ,\ q)$ is on the curve.
Find the value of q.

Answer (a)(i) ..... [1]

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(ii) Find the gradient of the curve at P.

Answer (a)(ii) ..... [3]

(iii) Find the x-coordinates of the turning points of the curve.

Answer (a)(iii) ..... [4]

(b) Differentiate with respect to x.

(i) $\frac{3}{x} + 7x$

Answer (b)(i) ..... [2]

(ii) $\sqrt{x}$

Answer (b)(ii) ..... [2]

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10 **(a)** Show that $\frac{x-2}{2}+\frac{1}{3}=\frac{23}{x+3}$ simplifies to $3x^2 + 5x - 150 = 0$.

[3]

(b) Hence solve $\frac{x-2}{2}+\frac{1}{3}=\frac{23}{x+3}$.

Give your answers correct to 2 decimal places.

Answer (b)(ii) $x =$ ..... or $x =$ ..... [4]

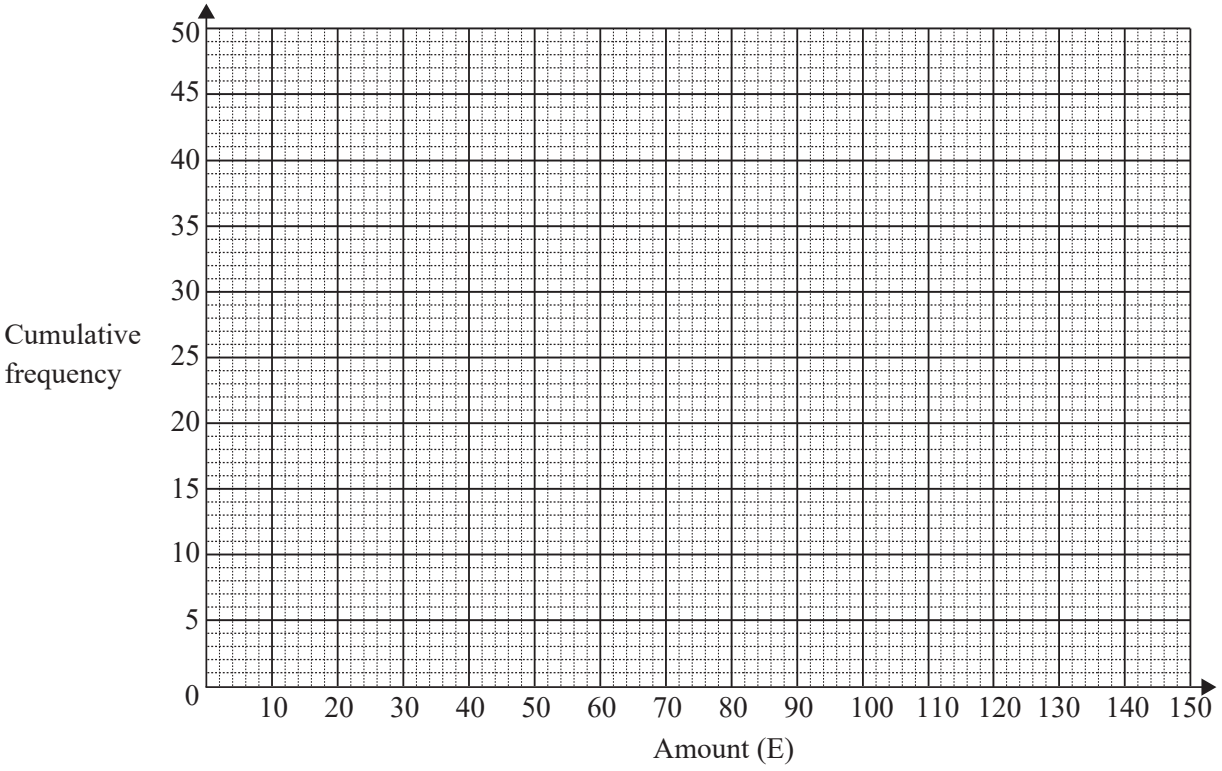
11 A group of 50 people used public transport.
The table shows the amount of money they spent on transport in a month.

Amount of money (Ex)	Frequency	Cumulative frequency
$0 < x \leqslant 25$	5	5
$25 < x \leqslant 50$	13	
$50 < x \leqslant 75$	22	40
$75 < x \leqslant 100$		46
$100 < x \leqslant 125$	3	49
$125 < x \leqslant 150$	1	

[3]

(a) Complete the cumulative frequency table.

(b) On the grid, draw the cumulative frequency curve [3]



(c) Use your curve to estimate

(i) median,

Answer (c)(i) E ..... [2]

(ii) inter quartile range,

Answer (c)(ii) E ..... [3]

(iii) the number of people who spent between E90 and E115.

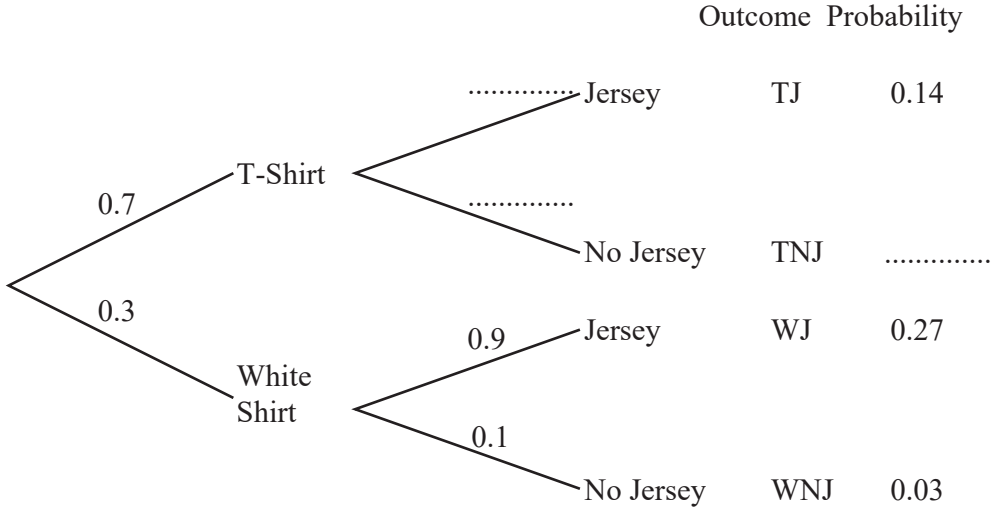
Answer (c)(iii) ..... [3]

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12 On Wednesdays students at Mtfunti High School can wear the school's T-shirt or a white shirt. The students are allowed to wear a jersey any day of the week.
The probability that a student wears a T-shirt on any given Wednesday is 0.7.
If the student wears a white shirt, the probability that he also wears a jersey is 0.9.

(a) The probability that the student wears a T-shirt and a jersey is 0.14.
The probability that a student wears a T-shirt but no jersey is abbreviated TNJ.

Complete the tree diagram.



[3]

(b) Calculate the probability that the student wears a jersey

(i) on a given Wednesday,

Answer (b)(i) ..... [2]

(ii) for 5 consecutive Wednesdays,

Answer (b)(ii) ..... [2]

(iii) at least once in 5 consecutive Wednesdays.

Answer (b)(iii) ..... [3]

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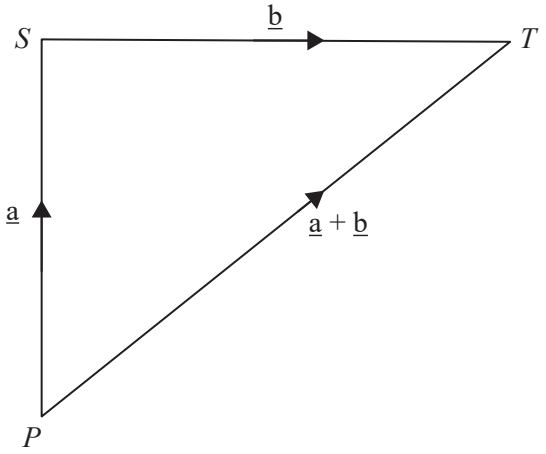
13 In the figure below, PST is a triangle.

$\overrightarrow{PS} = \underline{a}$.

$\overrightarrow{ST} = \underline{b}$.

$\overrightarrow{PT} = \underline{a} + \underline{b}$.

NOT TO SCALE



(a) You are given that $\underline{a} = \begin{pmatrix} 0 \\ 5 \end{pmatrix}$, $\underline{b} = \begin{pmatrix} t \\ 0 \end{pmatrix}$ and $|\underline{a} + \underline{b}| = \sqrt{89}$.

Calculate the value of t.

Answer (a) ..... [3]

(b) Find the size of angle STP.

Answer (b) .....° [3]

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