

1 (a) The angles in a triangle are in the ratio 3 : 4 : 8 .

(i) Show that the smallest angle of the triangle is 36° .

Answer(a)(i)

[2]

(ii) Work out the other two angles of the triangle.

Answer(a)(ii) and [2]

(b) Another triangle ABC has angle $BAC = 35^\circ$ and angle $ABC = 65^\circ$.

(i) **Using a protractor and straight edge** complete an accurate drawing of the triangle ABC .
The side AB has been drawn for you.



[2]

(ii) Measure the length, in centimetres, of the shortest side of your triangle.

Answer(b)(ii) cm [1]

(c) A different triangle has base 7.0 cm and height 5.6 cm.
Calculate the area of this triangle, giving the units of your answer.

Answer(c) [3]

2 (a) From the integers 50 to 100, find

(i) a multiple of 43,

Answer(a)(i) [1]

(ii) a factor of 165,

Answer(a)(ii) [1]

(iii) an odd number that is also a square number,

Answer(a)(iii) [1]

(iv) a number which is a square number and also a cube number.

Answer(a)(iv) [1]

(b) (i) Find the square root of 5929.

Answer(b)(i) [1]

(ii) Find the lowest common multiple of 24 and 30.

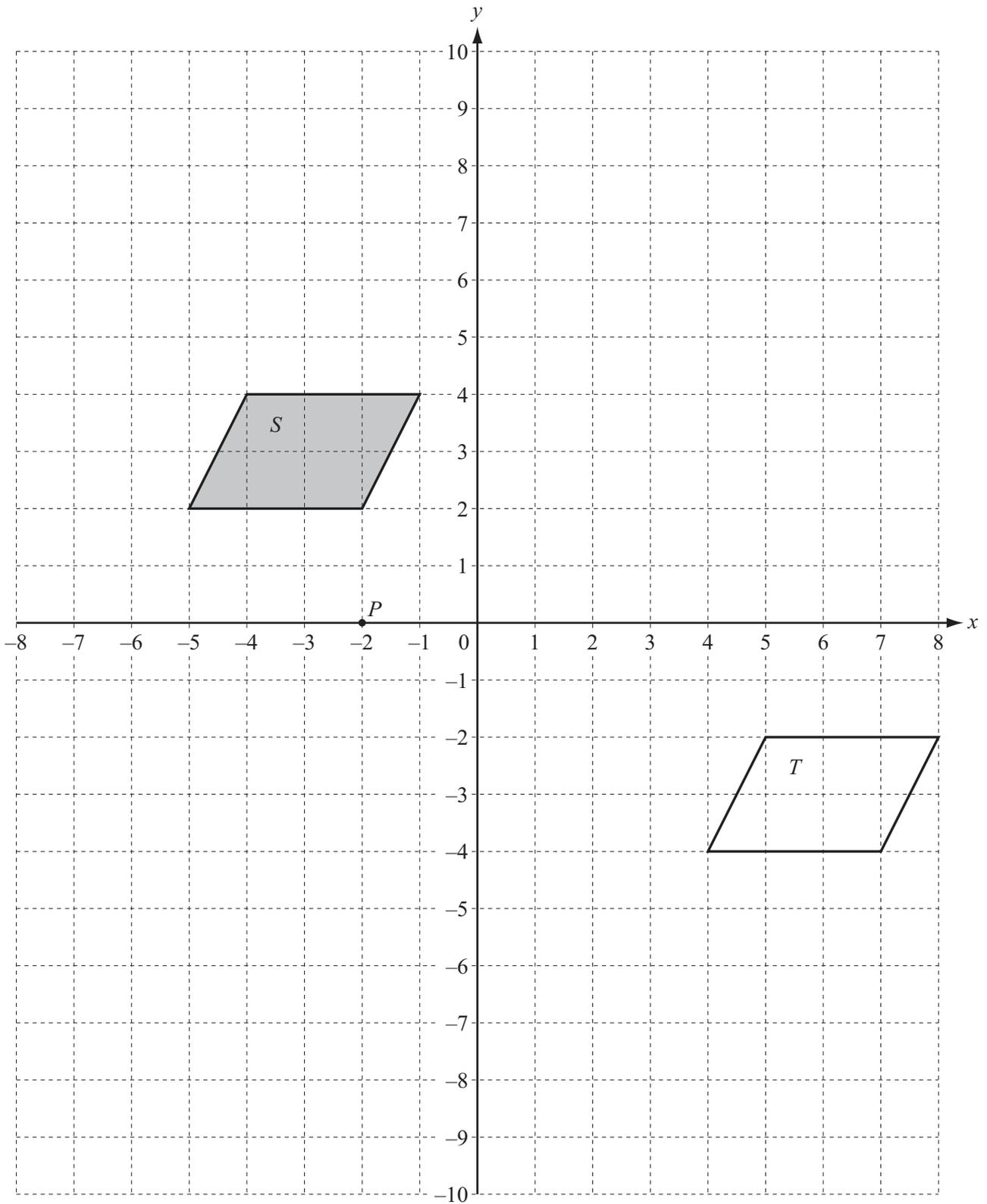
Answer(b)(ii) [2]

(c) Elena goes on a journey to the North Pole.
She leaves home at 7 am on 15 July and arrives at the North Pole at 10 pm on 27 July.

How long, in days and hours, did her journey take?

Answer(c) days hours [2]

3



The diagram shows two shapes, S and T , on a 1 cm^2 grid.
 P is the point $(-2, 0)$.

- (a) (i) Write down the mathematical name of shape S .

Answer(a)(i) [1]

- (ii) How many lines of symmetry does shape S have?

Answer(a)(ii) [1]

- (b) Describe the **single** transformation that maps shape S onto shape T .

Answer(b) [2]

- (c) On the grid,

- (i) draw the reflection of shape S in the y -axis, [2]

- (ii) draw the rotation of shape S about $(0, 0)$ through 90° anti-clockwise. [2]

- (d) On the grid, draw the enlargement of shape S with scale factor 2 and centre $P(-2, 0)$.
Label the image E . [2]

- (e) (i) Work out the area of shape S .

Answer(e)(i) cm^2 [2]

- (ii) How many shapes, identical to shape S , will fill shape E completely?

Answer(e)(ii) [1]

- (iii) Work out the area of shape E .

Answer(e)(iii) cm^2 [1]

- 4 Denzil grows tomatoes. He selects a random sample of 25 tomatoes. The mass of each tomato, to the nearest 5 grams, is shown below.

55	65	50	75	65
80	70	70	55	60
70	60	65	50	75
65	70	75	80	70
55	65	70	80	55

- (a) (i) Complete the frequency table.
You may use the tally column to help you.

Mass (grams)	Tally	Frequency
50		
55		
60		
65		
70		
75		
80		

[2]

- (ii) Write down the mode.

Answer(a)(ii) g [1]

- (iii) Find the range.

Answer(a)(iii) g [1]

- (iv) Show that the mean mass is 66 g.

Answer(a)(iv)

[2]

- (b) Denzil picks 800 tomatoes.
4% of the 800 tomatoes are damaged.

How many of these tomatoes are **not** damaged?

Answer(b) [2]

- (c) Denzil sells 750 of his tomatoes.

- (i) The mean mass of a tomato is 66 g.

Calculate the mass of the 750 tomatoes in kilograms.

Answer(c)(i) kg [3]

- (ii) Denzil sells his tomatoes at \$1.40 per kilogram.

Calculate the total amount he receives from selling all the 750 tomatoes.

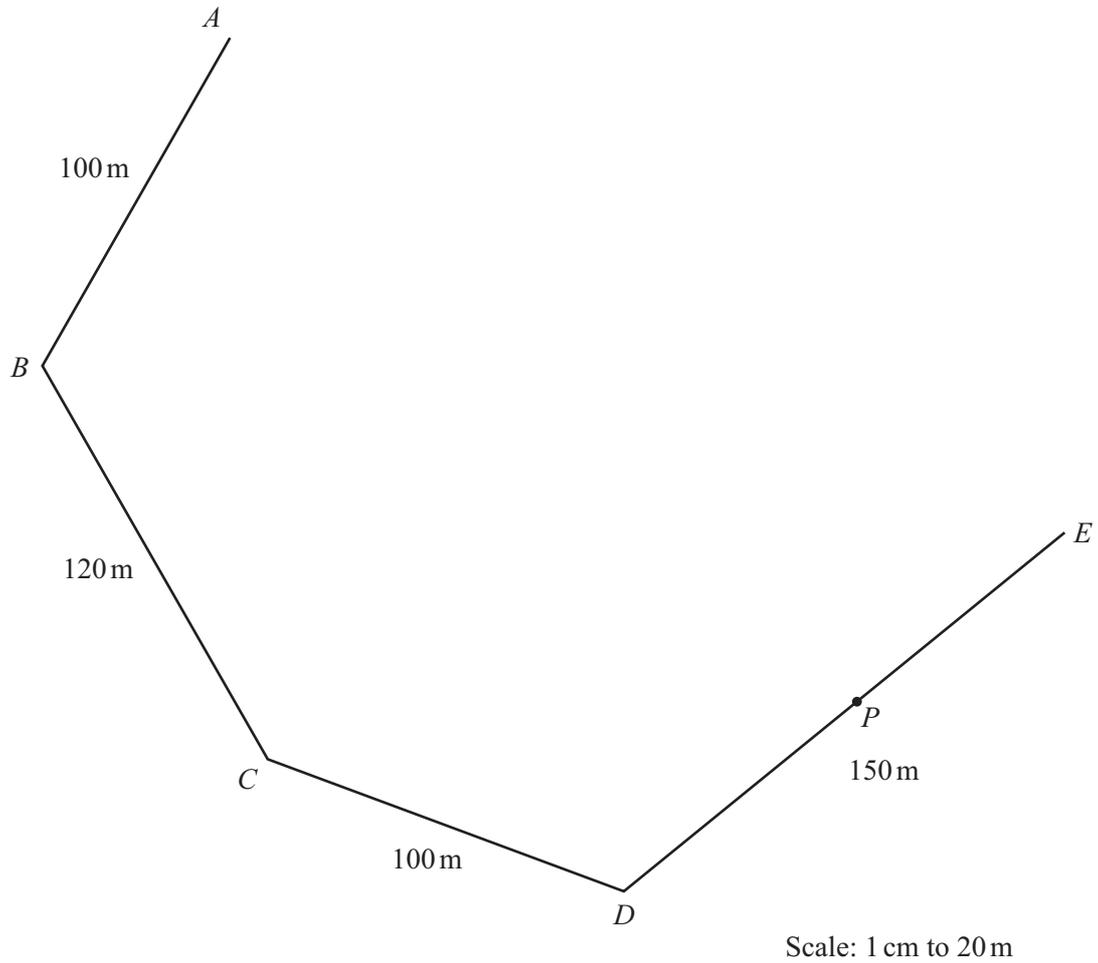
Answer(c)(ii) \$ [1]

- (iii) The cost of growing these tomatoes was \$33.

Calculate his percentage profit.

Answer(c)(iii) % [3]

- 5 Use a ruler and compasses only in parts (a), (c) and (d) of this question.
Show all your construction arcs.



Maria owns a farm.
The scale drawing shows part of the boundary of the farm.
The scale is 1 centimetre represents 20 metres.

- (a) The point F is such that $AF = 140\text{ m}$ and $EF = 160\text{ m}$.
 Angle BAF and angle DEF are both **obtuse** angles.

Complete the scale drawing of the farm boundary $ABCDEF$. [2]

- (b) Write down the name of the polygon $ABCDEF$.

Answer(b) [1]

- (c) (i) Construct the perpendicular bisector of the side CD . [2]

- (ii) Construct the bisector of angle ABC . [2]

- (iii) All the farm buildings are within a region that is

- nearer to C than to D
- and
- nearer to BC than to BA .

Shade the region containing the farm buildings. [1]

- (d) A fence post, P , is shown on the boundary DE .

- (i) Construct the locus of points that are 50 m from P and also inside the farm boundary. [2]

- (ii) A region for keeping pigs is within 50 m of P and inside the farm boundary.

Calculate the actual area for keeping pigs.

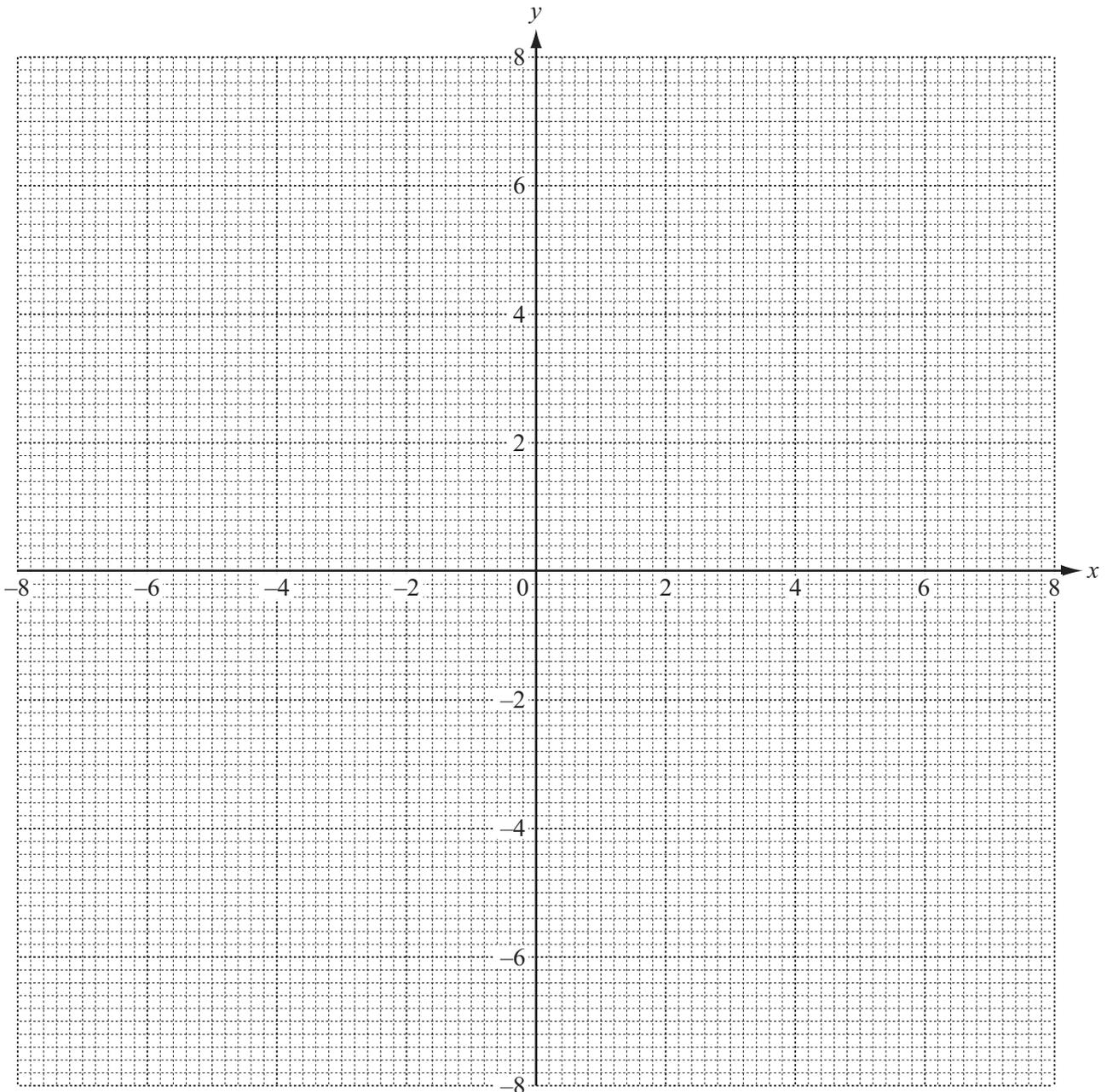
Answer(d)(ii) m^2 [2]

- 6 (a) (i) Complete the table of values for $y = \frac{8}{x}$, $x \neq 0$.

x	-8	-4	-2	-1		1	2	4	8
y		-2						2	

[3]

- (ii) On the grid, draw the graph of $y = \frac{8}{x}$ for $-8 \leq x \leq -1$ and $1 \leq x \leq 8$.



[4]

(iii) Write down the order of rotational symmetry of your graph.

Answer(a)(iii) [1]

(b) (i) Complete this table of values for $y = 1.5x + 3$.

x	-6	-4	-2	0	2
y	-6			3	

[2]

(ii) On the grid, draw the graph of $y = 1.5x + 3$.

[1]

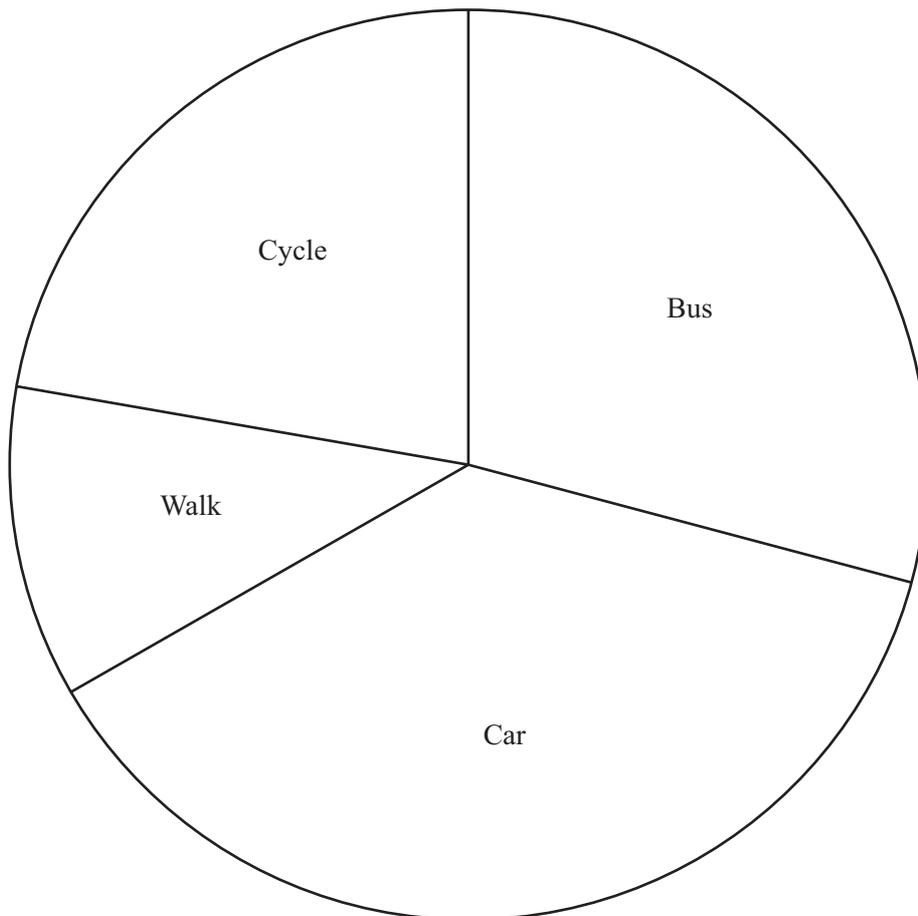
(c) Use your graphs to solve the equation $\frac{8}{x} = 1.5x + 3$.

Answer(c) $x =$ or $x =$ [2]

(d) Write down the gradient of the graph of $y = 1.5x + 3$.

Answer(d) [1]

- 7 120 people are asked how they travel to work.
The pie chart shows the results.



- (a) (i) Show that 45 people travel by car.

Answer(a)(i)

[2]

- (ii) A person is chosen at random from the 120 people.

Find the probability that this person travels to work by bus or by car.

Answer(a)(ii) [2]

- (b) One year later, the same 120 people were again asked how they travel to work.

Here is the information.

	Number of people
Walk	x
Cycle	31
Bus	17 more than the number of people who walk
Car	2 times the number of people who walk

- (i) Use this information to complete the following equation, in terms of x .

..... = 120 [3]

- (ii) Solve the equation to find the number of people who walk to work.

Answer(b)(ii) [3]

- 8 (a) Write down an expression for the total mass of c cricket balls, each weighing 160 grams, and f footballs, each weighing 400 grams.

Answer(a) grams [2]

- (b) Expand and simplify.

$$3(2x - 5y) - 4(x - 2y)$$

Answer(b) [2]

- (c) Factorise completely.

$$5x^2y - 20x$$

Answer(c) [2]

- (d) Solve the simultaneous equations.

$$\begin{aligned} 3x + 4y &= 7 \\ 4x - 3y &= 26 \end{aligned}$$

Answer(d) $x =$

$y =$ [4]

9 (a) For these sequences, write down the next two terms and the rule for finding the next term.

(i) 84, 75, 66, 57, ...

Answer(a)(i) , rule [3]

(ii) 2, 6, 18, 54, ...

Answer(a)(ii) , rule [3]

(b) For the sequence in **part (a)(i)**,

(i) write down an expression, in terms of n , for the n th term,

Answer(b)(i) [2]

(ii) find the 21st term.

Answer(b)(ii) [2]

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