ICAS.

PAPER

F

2019 MATHEMATICS

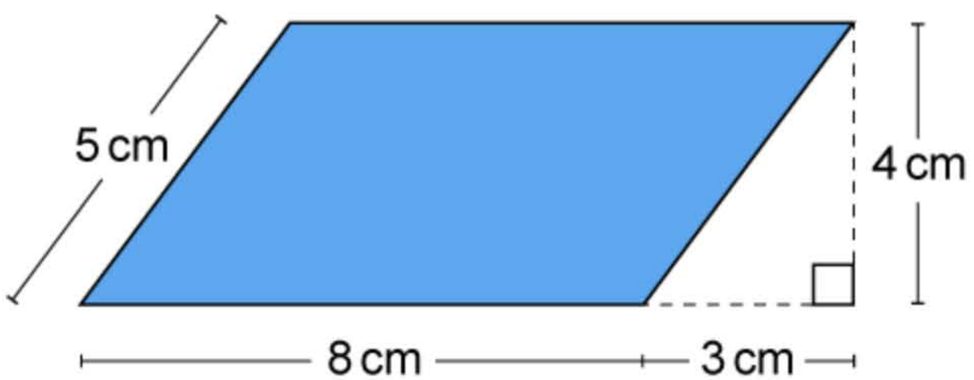
ICAS assessments

Kim makes different numbers using all three of these cards.

How many different 3-digit numbers can she make?

- [ ] 3
- [ ] 4
- [ ] 6
- [ ] 9

Sam wants to calculate the area of this parallelogram.



Which method will give him the correct area?

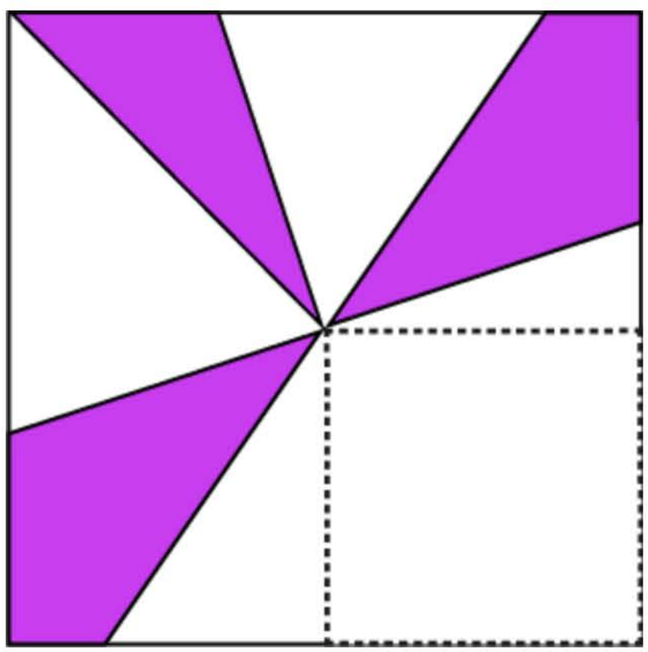
- [ ] 8×4
- [ ] 8×5
- [ ] $4 \times (8 + 3)$
- [ ] $5 \times (8 + 3)$

This number line has been divided into equal parts.

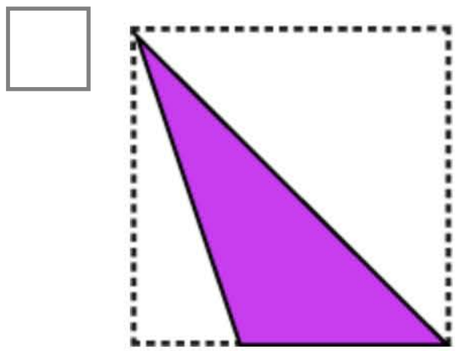
What value must ? be?

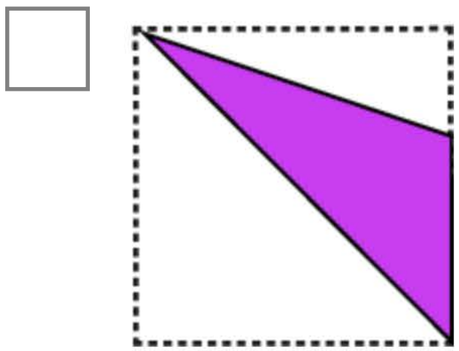
- [ ] 7
- [ ] 8
- [ ] 10
- [ ] 11

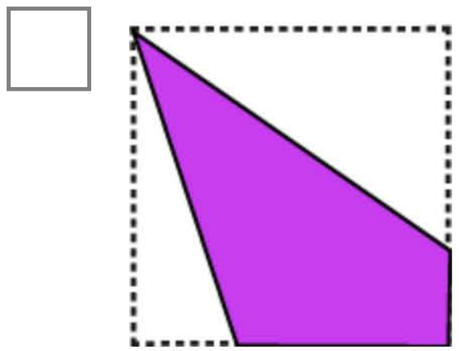
Jill is drawing a shape that will have rotational symmetry of order 2.

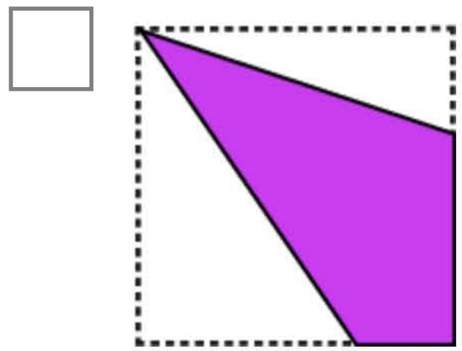


Which of these will complete her drawing?









Tony secures 6 weights on the bar at the gym as shown.

Each weight has a mass two-thirds of the next largest weight. The large weight has a mass of 9 kg.

Tony weighs this bar. It has a total mass of 55 kg.

What is the mass of the bar without the six weights?

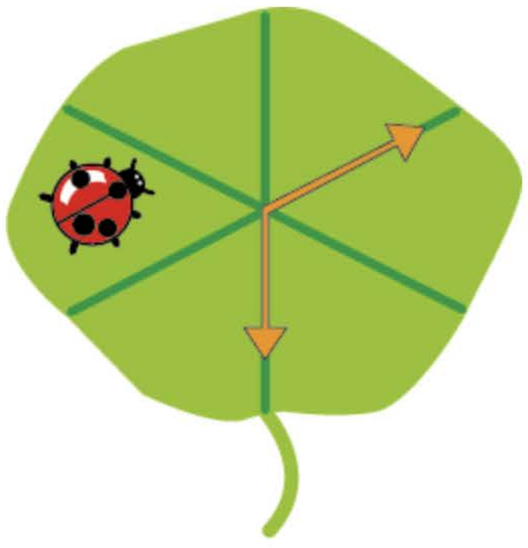
- [ ] 13 kg
- [ ] 16 kg
- [ ] 17 kg
- [ ] 19 kg

 is a positive integer and $\frac{\square}{2} \times (\square - 3) = 65$

What value must  be?

- [ ] 9
- [ ] 10
- [ ] 12
- [ ] 13

The veins on this lily pad form equal angles at the centre.

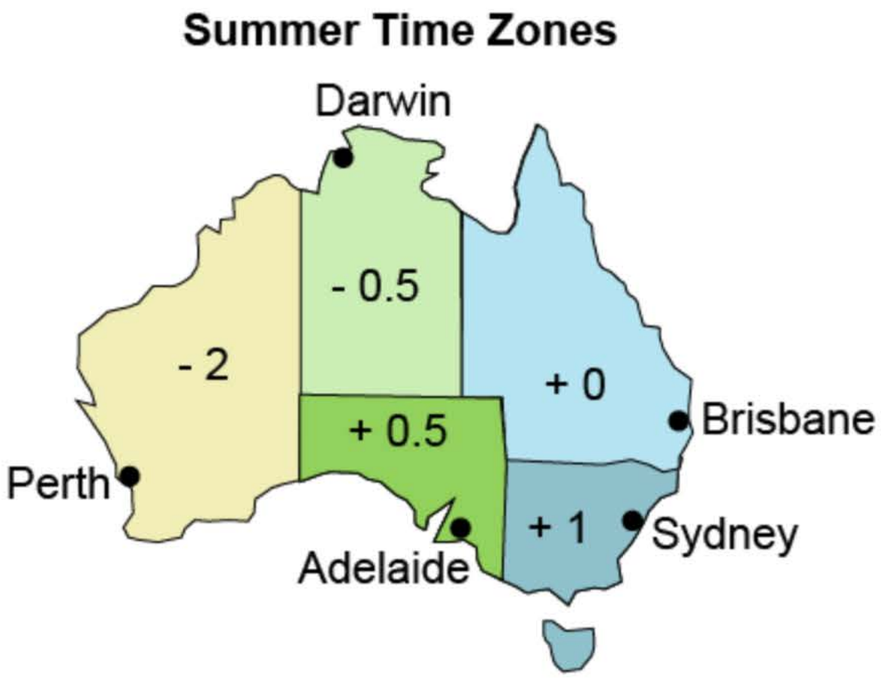


What is the size of the **REFLEX** angle between the two arrows?

- [ ] 120°
- [ ] 180°
- [ ] 240°
- [ ] 300°

The map shows the number of hours each Australian region differs from the local time in Brisbane during summer.

Brisbane is 2 hours ahead of Perth.

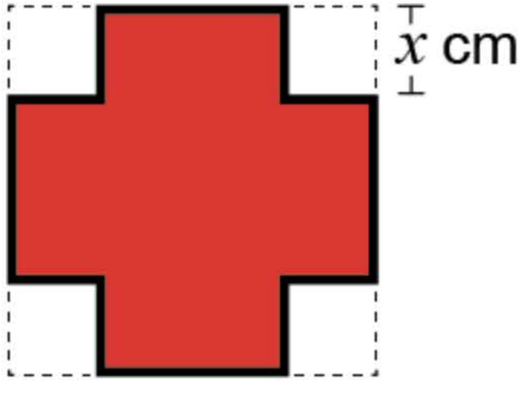


Rolfe is in Sydney. At 10 am he calls his aunt who is on holidays in another city shown on the map. She tells Rolfe it is 9:30 am where she is.

In which city is Rolfe's aunt?

- [ ] Perth
- [ ] Darwin
- [ ] Brisbane
- [ ] Adelaide

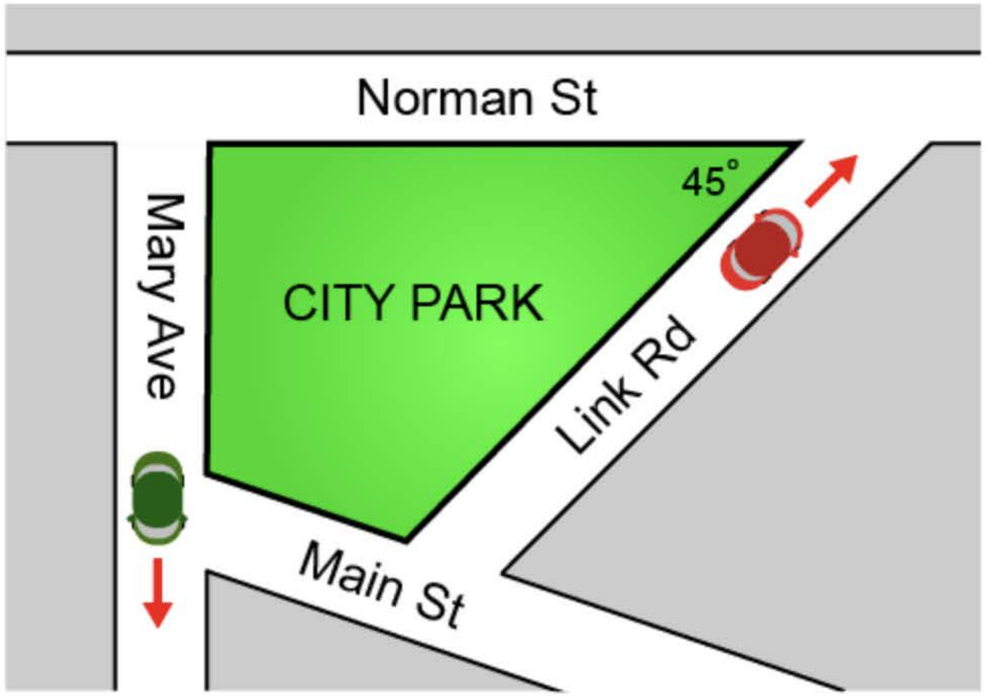
Taila had a red paper square. She cut a square of side length x cm from each corner.



How does the perimeter of this new shape compare to the perimeter of the original square?

- [ ] the same
- [ ] smaller by $4x$ cm
- [ ] larger by $4x$ cm
- [ ] larger by $8x$ cm

The green car is travelling west along Mary Ave.



In which direction is the red car travelling along Link Rd?

- [ ] south-east
- [ ] north-east
- [ ] south-west
- [ ] north-west

Mrs Smith bought a 600 mL bottle of juice.

She had 4 glasses.

Mrs Smith poured:

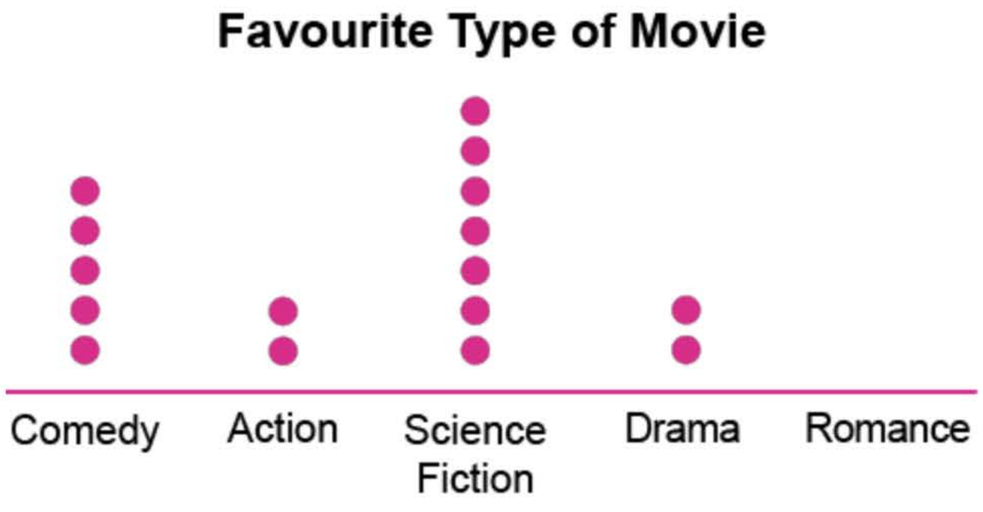
- half of the juice into glass 1
- half of the remaining juice into glass 2
- half of the remaining juice into glass 3
- the rest of the juice into glass 4.

How much more juice was in glass 1 than in glass 4?

- ☐ 75 mL
- ☐ 150 mL
- ☐ 225 mL
- ☐ 262.5 mL

The teacher asked all 30 students in Simon's class to name their favourite type of movie.

Simon is drawing a dot plot to show the results. Some dots for Drama and Romance still need to be added.



Four more students chose Romance than Comedy.

How many students chose Drama?

- [ ] 4
- [ ] 5
- [ ] 6
- [ ] 7

Jim is writing a sequence of numbers using a repeating pattern.

1 2 4 7 8 10 13 14 16 19 20 ...

Which statement about this sequence is **NOT** true?

- [ ] Consecutive odd numbers in the sequence differ by 6.
- [ ] The sequence will contain all multiples of 7.
- [ ] There are no multiples of 12 in the first 15 numbers.
- [ ] Two even numbers follow each odd number.

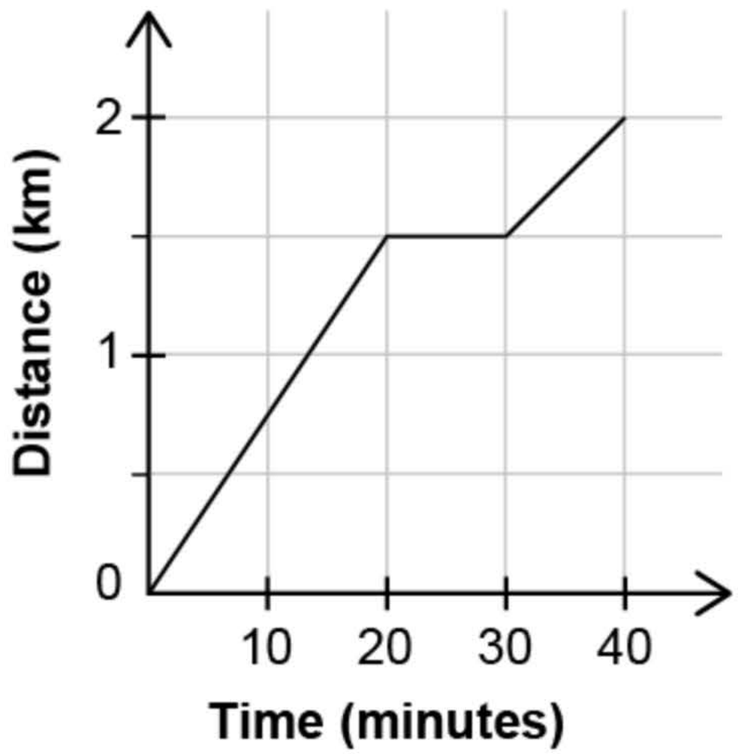
Anh and Jemma collect coins.

Jemma has two-thirds the number of coins that Anh has.

What percentage of the total number of coins does Jemma have?

- [ ] 67%
- [ ] 60%
- [ ] 40%
- [ ] 33%

This graph represents Jane's walk to school.



Which table of values matches her graph?

☐

Time	10	20	30	40
Distance	0.6	1.5	1.75	2

☐

Time	10	20	30	40
Distance	0.75	1.5	1.75	2

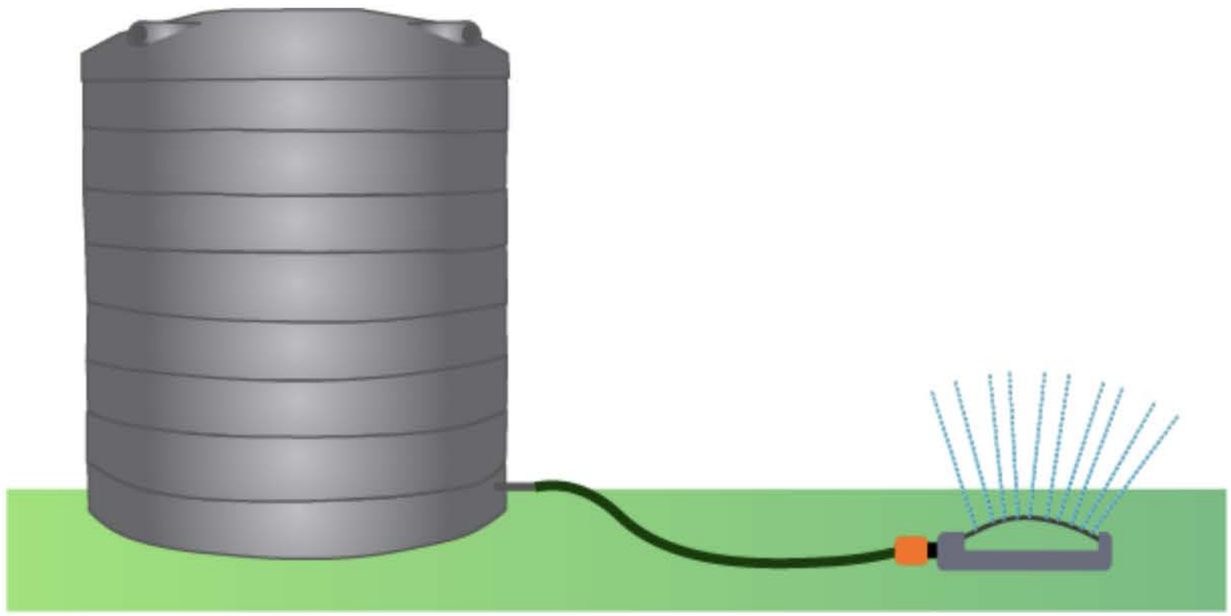
☐

Time	10	20	30	40
Distance	0.6	1.5	1.5	2

☐

Time	10	20	30	40
Distance	0.75	1.5	1.5	2

Mal had 2000 litres of water in his tank. He attached a sprinkler to the tank and turned on the tap. The sprinkler sprayed 1.5 litres of water every minute.



Mal turned the tap off after 8 hours.

How much water was left in the tank?

- [ ] 720 L
- [ ] 800 L
- [ ] 1200 L
- [ ] 1280 L

Emma chose a positive integer and added it to its square.

Which of these statements about this sum is always true?

- [ ] It is always even.
- [ ] It is divisible by 3.
- [ ] It is equal to the number cubed.
- [ ] It is even only if the integer is even.

Marcus is travelling from South Africa to the USA.

He wants to change 9000 South African Rand (ZAR) into United States Dollars (USD) at the bank.

The current exchange rate is:

1 ZAR = 0.07 USD

He has to pay a 3% commission to the bank when he changes his money.

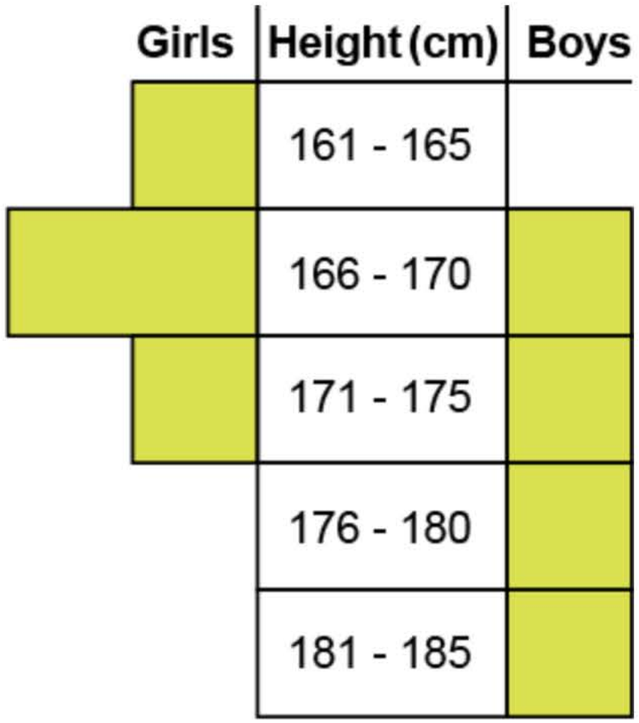
How many USD should Marcus receive after he has paid the commission?

- [ ] 603 USD
- [ ] 611.1 USD
- [ ] 627 USD
- [ ] 648.9 USD

A group of five boys and five girls measured and recorded their heights to the nearest centimetre. The ordered results are shown here:

164, 167, 168, 168, 170, 172, 174, 180, 182, 182.

The tallest girl used a double bar graph to compare the heights of the other four girls with the heights of four of the boys.

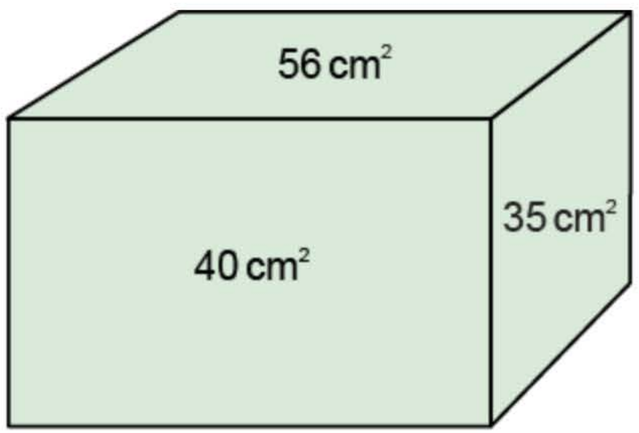


Which statement is true?

- [ ] The missing boy's height is 172 cm.
- [ ] The missing girl's height is 167 cm.
- [ ] The shortest boy's height is 164 cm.
- [ ] The tallest girl's height is 182 cm.

Sarah calculated the area of each face on a rectangular prism.

The areas of the front, top and side are shown on the diagram.



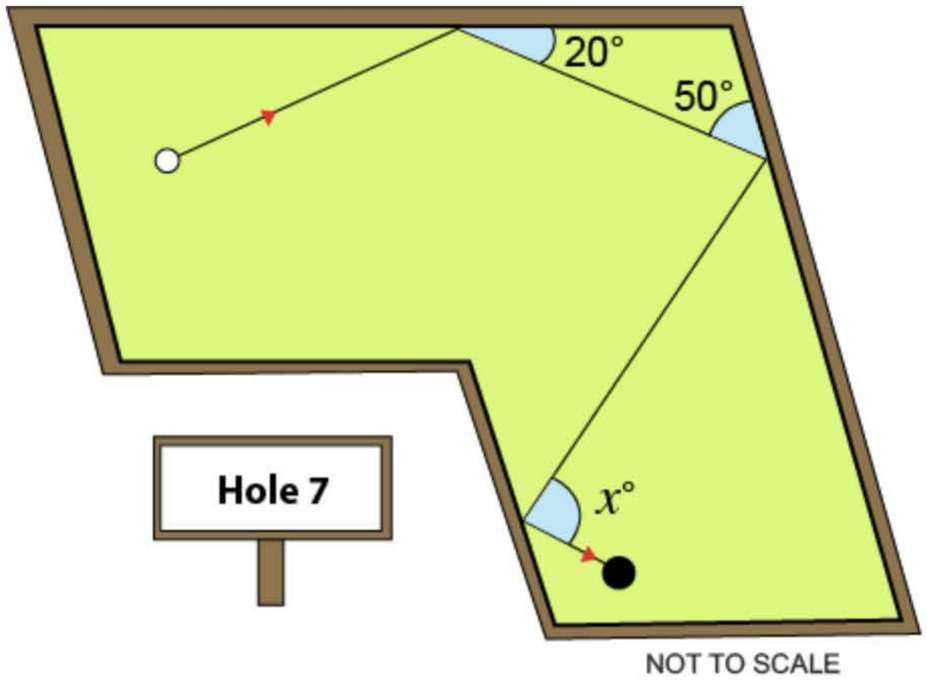
NOT TO SCALE

What is the volume of the prism?

- [ ] 224 cm³
- [ ] 245 cm³
- [ ] 262 cm³
- [ ] 280 cm³

Leanne is playing minigolf. All opposite sides on Hole 7 are parallel.

Leanne hit the ball into the hole. The diagram shows the path of the ball.

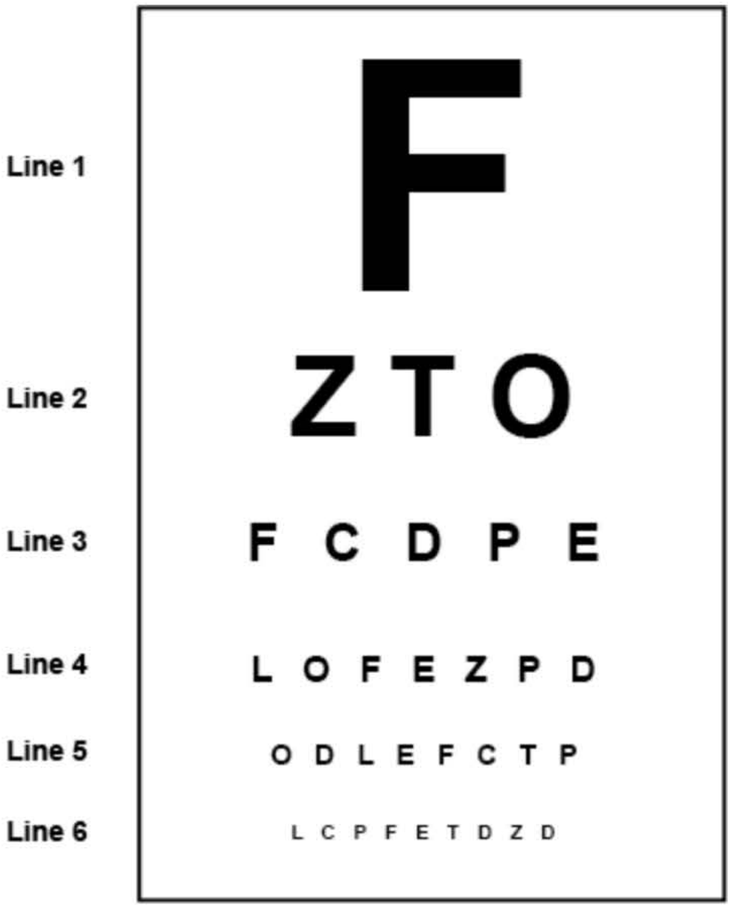


Every time the ball hit a side, the angle at which the ball approached a side was equal to the angle at which it rebounded.

What is the value of x?

- ☐ 50
- ☐ 70
- ☐ 80
- ☐ 100

Visual acuity of 6/1.5 means that a person with excellent vision can read the bottom line on this chart accurately from a distance of 6 m compared to 1.5 m for someone with normal vision.



The minimum visual acuity associated with each line of this chart follows a pattern.

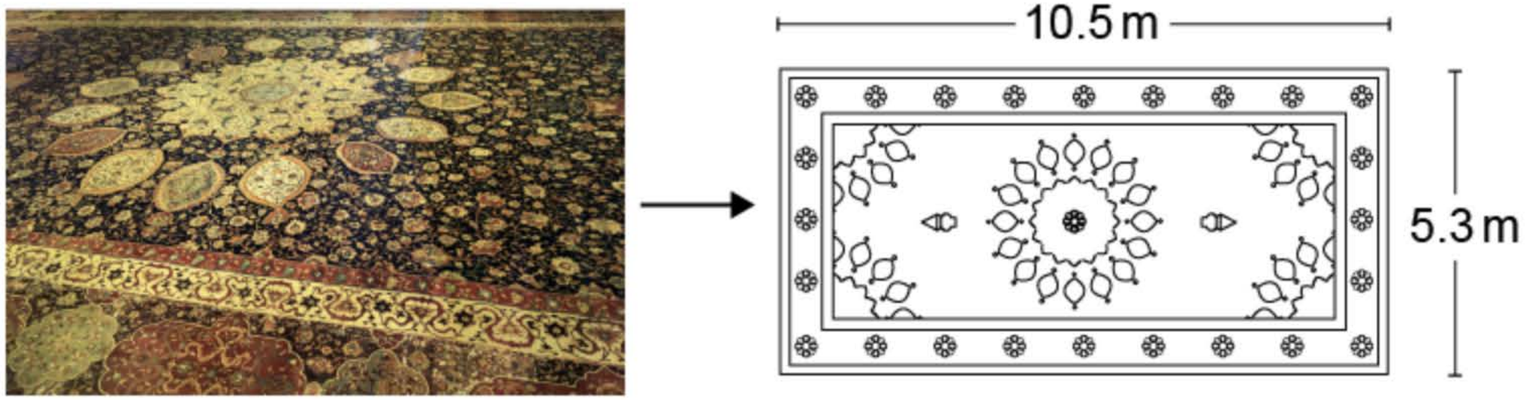
Vision	Chart line	Minimum visual acuity
Poor	1	6/48
Satisfactory	3	?
Normal	4	6/6
Excellent	6	6/1.5

Sunil read Line 3 accurately from a distance of 6 m.

What minimum visual acuity does Sunil have?

- [ ] 6/24
- [ ] 6/15
- [ ] 6/12
- [ ] 6/10.5

The Ardabil carpet is the oldest dated carpet in the world.

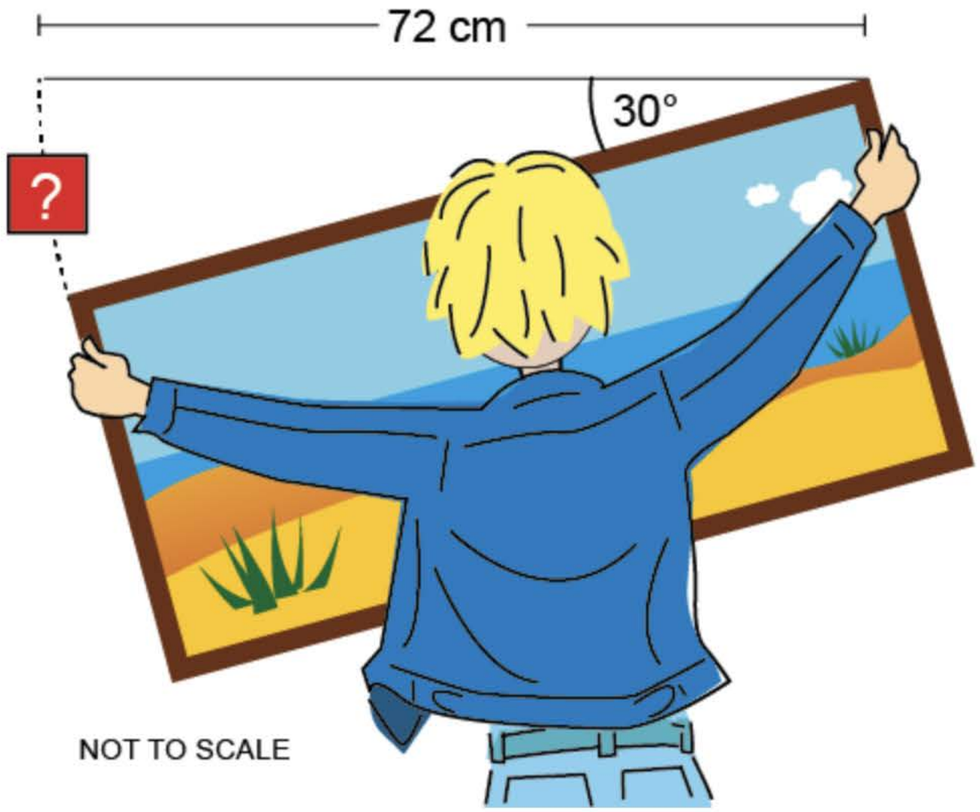


There are 5300 knots in every 10 cm² of carpet.

Approximately how many knots are there in the carpet?

- [ ] 300 million
- [ ] 30 million
- [ ] 300 thousand
- [ ] 30 thousand

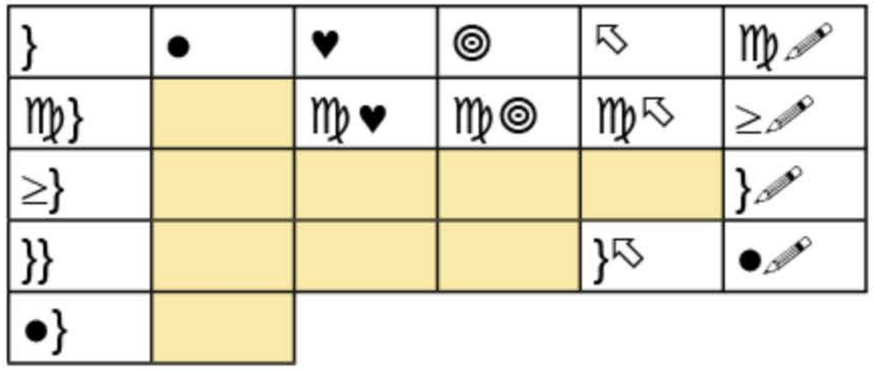
Mike is hanging a painting of length 72 cm. He has fixed the right top corner to the wall and now has to rotate it 30° to make it horizontal.



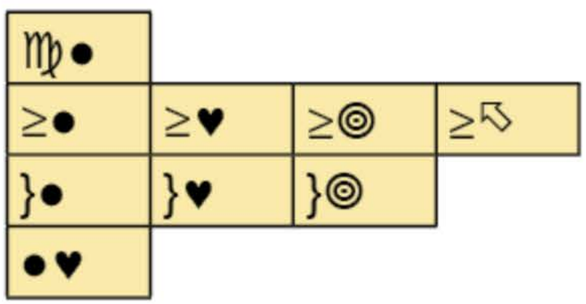
What is the length of the arc, to the nearest cm, formed by this rotation?

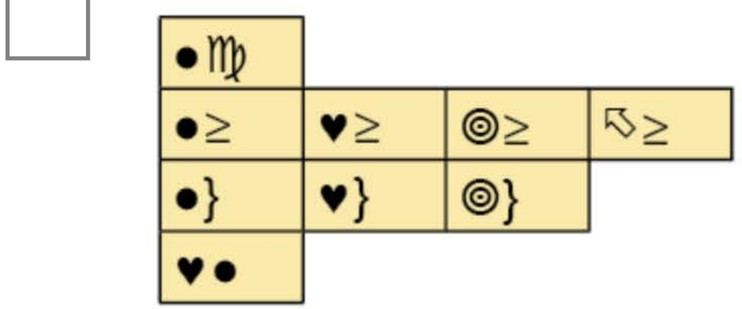
- [ ] 37 cm
- [ ] 38 cm
- [ ] 41 cm
- [ ] 42 cm

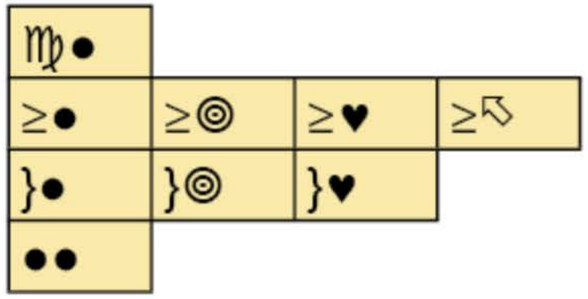
Kate is using a pattern of symbols to write a code. Some of the code is missing.

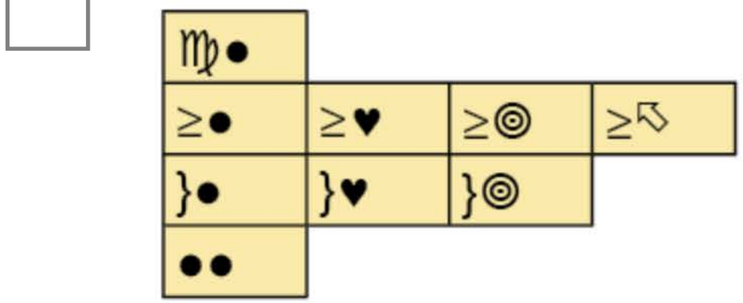


Which of these patterns completes the code?





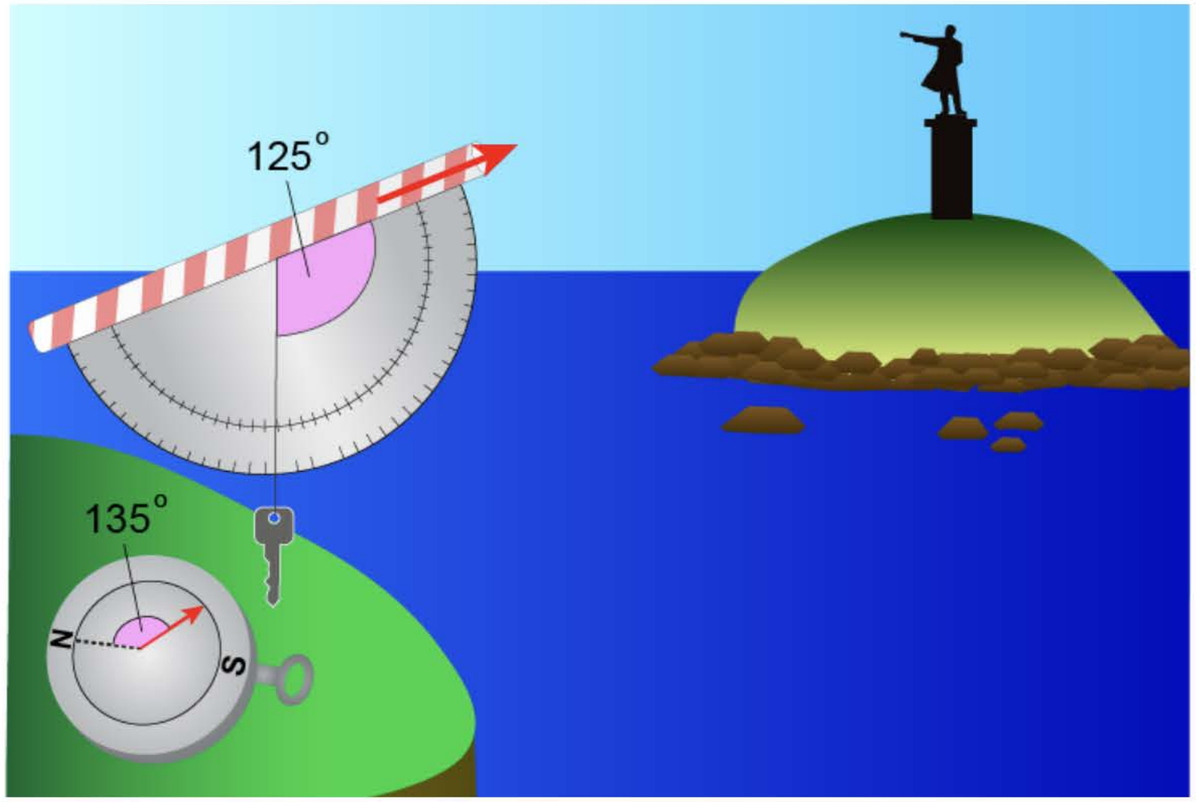




Jim made a clinometer with a straw, a protractor and a weighted piece of string.

Jim looked through the straw to the top of the statue and measured the angle.

Then he used his compass to obtain a bearing.



Which is the bearing and angle of inclination of the statue's position from Jim?

☐

Bearing	Inclination
north-east	35°

☐

Bearing	Inclination
north-east	55°

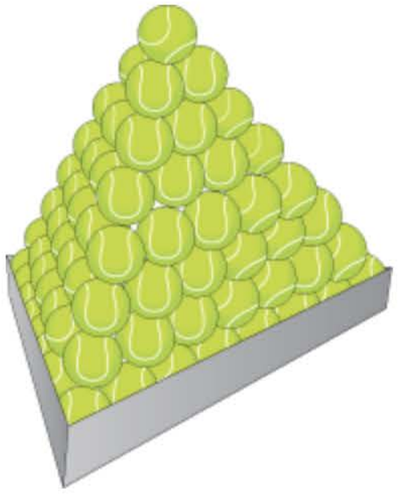
☐

Bearing	Inclination
south-east	35°

☐

Bearing	Inclination
south-east	55°

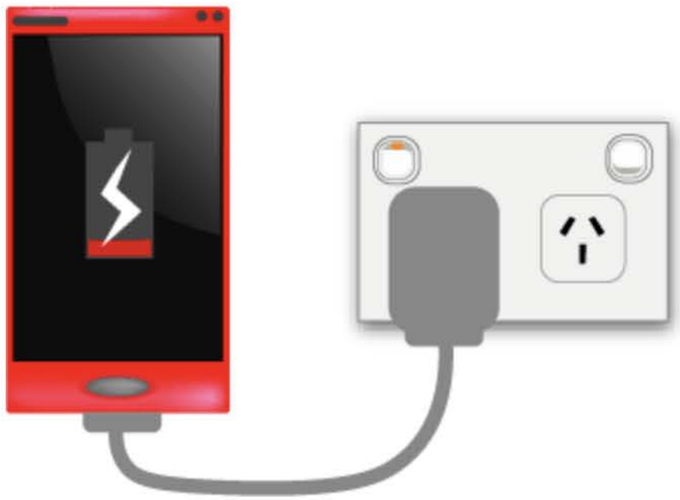
Min had a regular triangular frame that holds 36 tennis balls. He used more tennis balls to build a triangular pyramid which was 8 layers high.



How many tennis balls did Min use to build the pyramid?

- [ ] 108
- [ ] 112
- [ ] 120
- [ ] 144

The battery in Angela's mobile phone is completely flat. She plugs it into the charger at 3 pm. The amount of charge stored in the battery increases by 8% of its full charge every 10 minutes.



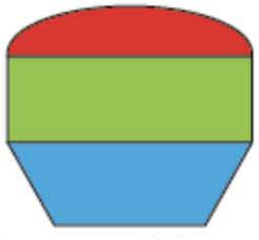
At what time will the battery hold 84% of its full charge?

- [ ] 4.05 pm
- [ ] 4.20 pm
- [ ] 4.25 pm
- [ ] 4.45 pm

Sam had identical copies of these three paper shapes.

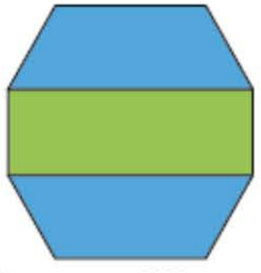
He used them to create these designs.

Design 1



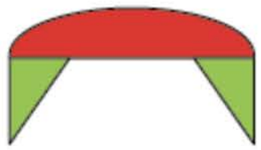
Area = 17 cm²

Design 2



Area = 20 cm²

Design 3



Area = 5 cm²

Design 4

Area = ? cm²

What value must ? be?

- [ ] 10
- [ ] 11
- [ ] 12
- [ ] 13

Pam went to see a puppet show. She started to record the number of adults and children in different parts of the theatre.

Two-thirds of the people sitting on chairs were children.

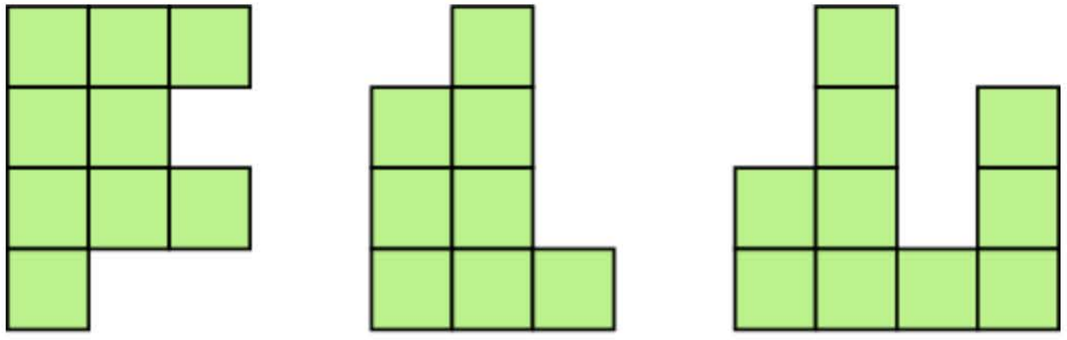
	Sitting on chairs	Sitting on floor	Standing at back	Total
Adults	20		5	
Children		20		75
Total		30		

The puppeteer chose a child at random to come onto the stage.

What is the probability that this child was standing at the back?

- ☐ $\frac{1}{5}$
- ☐ $\frac{2}{11}$
- ☐ $\frac{3}{22}$
- ☐ $\frac{4}{15}$

Harry made a 3-D shape by stacking identical cubes. He drew three different views of his 3-D shape.



Top view

Front view

Left side view

What is the smallest number of cubes Harry could have used to make this shape?

- ☐ 12
- ☐ 15
- ☐ 18
- ☐ 20

Tony started with two integers, a and b.

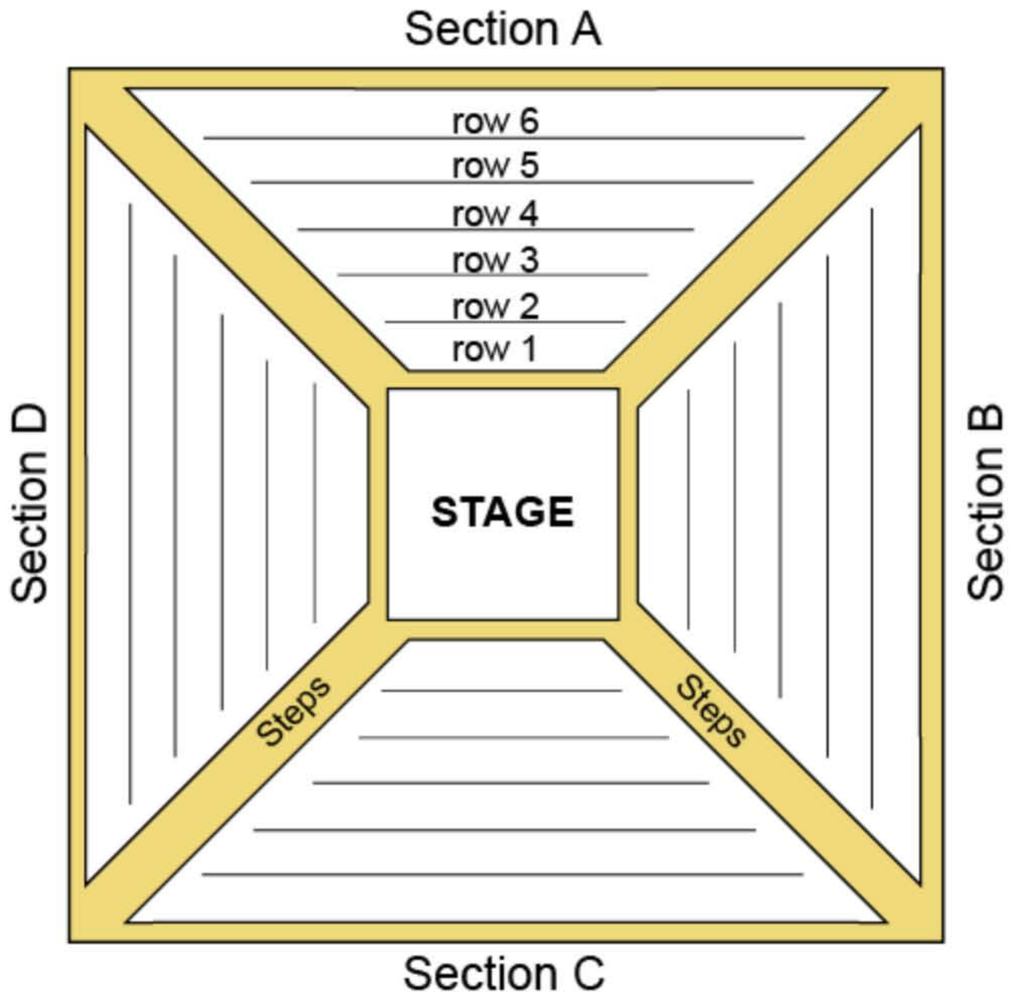
He divided a by –3. His answer was 6.

He multiplied 6 by b. His answer was –24.

What is the value of $a - b$?

- [ ] –22
- [ ] –14
- [ ] –6
- [ ] 2

Jack saw a show. The theatre in which the show was held has four identical sections around the stage with six rows of seating in each section.



In each section there are 20 seats in the first row and 50 seats in the sixth row. The number of seats in a row increases by the same number from one row to the next.

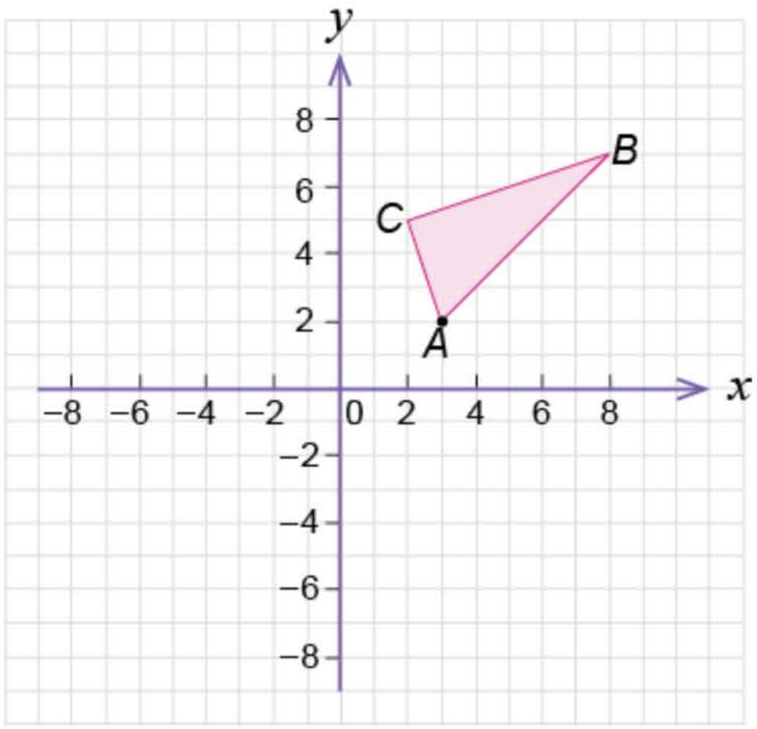
How many seats are in the theatre?

- ☐ 840
- ☐ 980
- ☐ 1500
- ☐ 1680

The letters a, b, c and d represent consecutive positive integers where $a < b < c < d$.
Which of these inequalities is **NOT** true?

- ☐ $\frac{b}{c} > \frac{a}{d}$
- ☐ $\frac{a}{b} < \frac{c}{d}$
- ☐ $a \div \frac{b}{c} > 1$
- ☐ $d \div \frac{a}{b} < 1$

Florence drew $\triangle ABC$ in the first quadrant.



She rotated the triangle 90° anticlockwise about A.

What are the new coordinates of C?

- ☐ (0, 1)
- ☐ (–5, 2)
- ☐ (–2, 3)
- ☐ (6, 3)

China is launching a mini-moon to replace streetlights in Chengdu. It is to be made of mirrors that will reflect enough light to illuminate 50 km² of land.

If this is successful, three larger mini-moons will be launched a few years later.

Together the four mini-moons will illuminate 5000 km² of land.

What percentage increase in illuminated land will be provided by the three larger mini-moons compared to having just one small mini-moon?

[ ] %

Oscar plays basketball. In his last 5 games he scored the following points per game:

13, 13, 15, 19, 20.

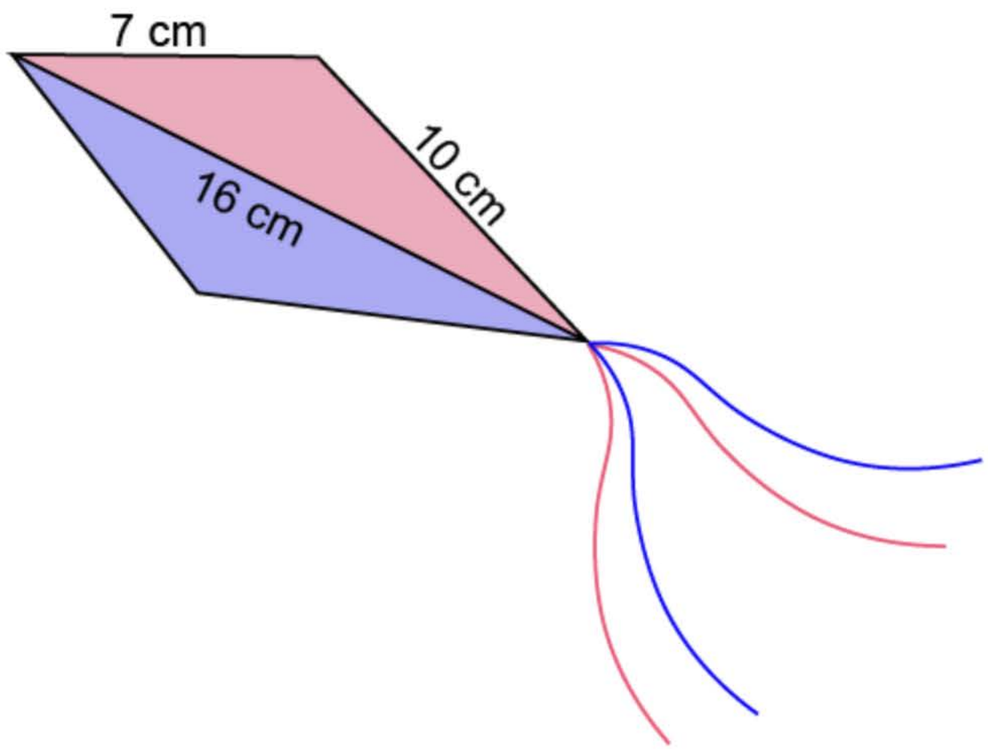
The mean score for these games is 16 and the median score is 15.

Oscar played one more game and scored less than 20 points.

The new mean was the same as the new median.

How many points did Oscar score in Game 6?

Jia drew this kite.



She used Heron's formula to calculate the area of one triangle making up her kite.

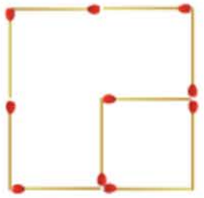
Heron's Formula
$S = \frac{A+B+C}{2}$ where A, B and C are the side lengths.
Area = $\sqrt{S(S-A)(S-B)(S-C)}$

What is the total area of her kite correct to the nearest cm^2?

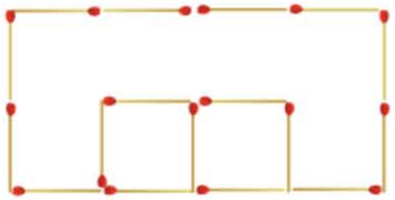
$\square$ cm^2

Jake is making a pattern using matchsticks.

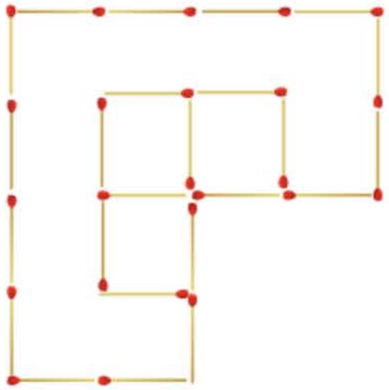
Each time a complete square has been formed, the next shape builds to the right.



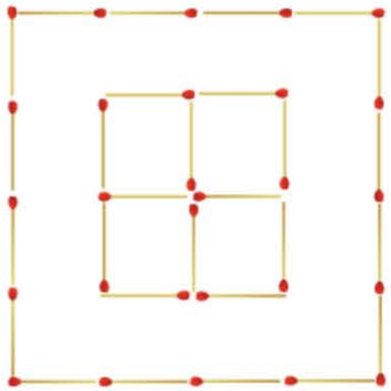
Shape 1
10 matchsticks



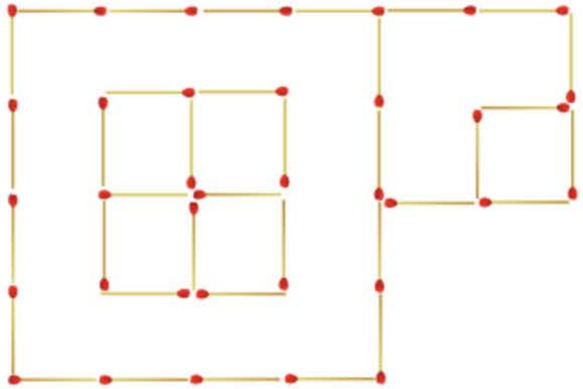
Shape 2
17 matchsticks



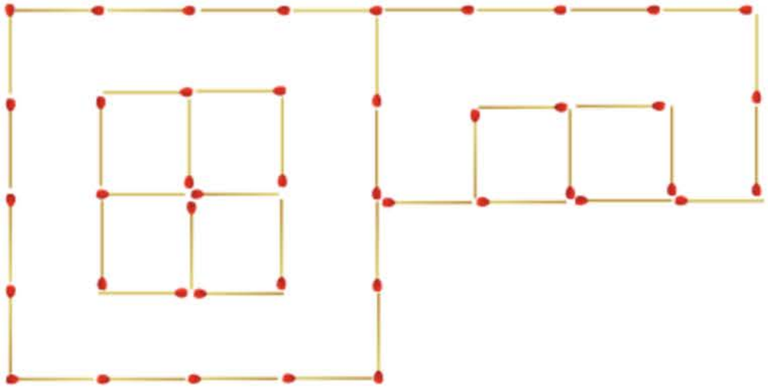
Shape 3
24 matchsticks



Shape 4
28 matchsticks



Shape 5
36 matchsticks



Shape 6
43 matchsticks

He continues adding matches in this manner, completing one shape after another.

How many matchsticks will be in Shape 22?

Results

Question number	Correct answer	Mark	Category	Descriptor
1	C		Chance & Data	Count the number of arrangements of three cards
2	A		Measures & Units	Choose the correct dimensions to calculate the area of a parallelogram
3	D		Number & Arithmetic	Determine the value of a position on a number line
4	A		Space & Geometry	Identify the shape that completes a rotational symmetrical pattern
5	C		Number & Arithmetic	Solve a problem involving multiplication by a fraction
6	D		Algebra & Patterns	Use substitution to determine the value of an unknown
7	C		Space & Geometry	Calculate the reflex angle in four sectors of a hexagon
8	D		Measures & Units	Interpret a graph involving time zones
9	A		Measures & Units	Compare the perimeter of a cut-out shape to the original perimeter
10	A		Space & Geometry	Determine a direction from a map
11	C		Number & Arithmetic	Solve a problem involving repeated halving and a difference
12	D		Chance & Data	Complete a dot plot by interpreting the given information
13	B		Algebra & Patterns	Describe the pattern in a sequence of numbers
14	C		Number & Arithmetic	Calculate the percentage of the total left after subtracting a sum
15	D		Algebra & Patterns	Identify the table of values that matches a travel graph
16	D		Measures & Units	Calculate the remaining volume given a rate of water loss
17	A		Number & Arithmetic	Establish a relationship between a number and its square
18	B		Number & Arithmetic	Solve a money exchange problem involving commission
19	D		Chance & Data	Interpret a double bar graph
20	D		Measures & Units	Calculate the volume of a prism given the area of each face
21	C		Space & Geometry	Find the size of an angle between a transversal and parallel lines
22	C		Algebra & Patterns	Interpret a pattern in a table to find a missing term
23	A		Measures & Units	Solve a problem involving area, conversion and rounding
24	B		Space & Geometry	Calculate the arc length given the angle of rotation and the radius
25	D		Algebra & Patterns	Follow a symbolic pattern to complete a code
26	C		Space & Geometry	Calculate a complementary angle and bearing in a surveying context
27	C		Algebra & Patterns	Calculate the total number of balls used in forming a triangular pyramid
28	D		Measures & Units	Solve a problem involving rates, percentages and time
29	B		Measures & Units	Calculate the area of a composite shape given a number of related areas
30	A		Chance & Data	Complete a table and determine the probability of a certain event

Results

Question number	Correct answer	Mark	Category	Descriptor
31	B	☐ ☐	Space & Geometry	Determine the minimum number of cubes needed to make a model given three views
32	B	☐ ☐	Algebra & Patterns	Solve a problem involving division, multiplication and subtraction of integers
33	A	☐ ☐	Number & Arithmetic	Solve a problem involving an arithmetic series
34	D	☐ ☐	Algebra & Patterns	Understand that division by a proper fraction gives a result larger than the dividend
35	A	☐ ☐	Space & Geometry	Locate the position of a point after a 90 degree rotation
36	9900	☐ ☐	Number & Arithmetic	Calculate a percentage increase that is greater than 100 per cent
37	4	☐ ☐	Chance & Data	Determine the score to be added so the mean and median are equal
38	45	☐ ☐	Algebra & Patterns	Substitute values into two formulae to solve an area problem
39	139	☐ ☐	Algebra & Patterns	Find and apply a rule for generating a given term

You have completed this practice test.

Your mark is 0 / 39 0%

Click here to reset the test and try again.

ICAS.

PAPER

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