MCEECDYA
Ministerial Council for Education,
Early Childhood Development and Youth Affairs

NATIONAL ASSESSMENT PROGRAM
LITERACY AND NUMERACY

NUMERACY
CALCULATOR ALLOWED

YEAR
9
2010

SESSION 1

0:40

Time available for students to complete test: 40 minutes

Use 2B or HB pencil **only**

Do not write on this page.

PRACTICE QUESTIONS

P1 50, 100, 150, 200, 250, **?**

Shade one bubble.

Which number comes next in this sequence?

251	260	300	350
⬭	⬭	⬭	⬭

P2 Use numbers to write one dollar and seventy-five cents.

Write your answer in the box.

$ ☐

P3 268 cents equals

Write your answer in the boxes.

☐ dollars and ☐ cents.

YEAR 9 **NUMERACY (CALCULATOR ALLOWED)**

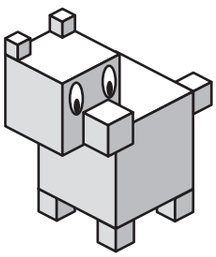
1 What number is missing from this number sentence?

Shade one bubble.

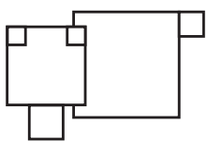
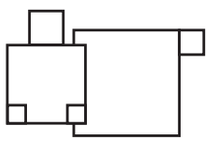
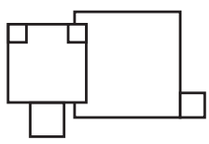
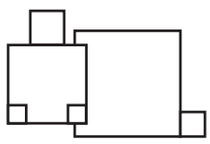
$5 \times$ **?** $+ 15 = 85$

2	10	14	20
⬭	⬭	⬭	⬭

2 Tracey drew this design for a wooden toy.

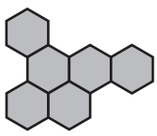


Which picture shows a **top** view of Tracey's design?

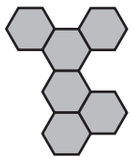
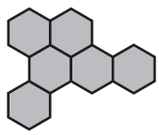
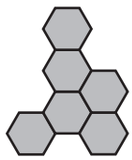
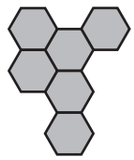





⬭ ⬭ ⬭ ⬭

3 Joe made this design by joining six tiles together.
The tiles are grey on all faces.



Which of these could **not** be Joe's design?

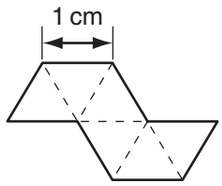
⬭ ⬭ ⬭ ⬭

4 Which expression is always equal to $2x + 5 + 3x + 4$?

$7x + 7$	$14x$	$5x + 9$	$8x + 6$
⬭	⬭	⬭	⬭

5 This shape is made with 6 equilateral triangles.

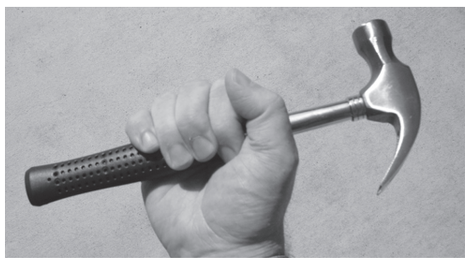
Shade one bubble.



What is the perimeter of the shape?

6 cm	8 cm	10 cm	18 cm
⬭	⬭	⬭	⬭

6



Which of these is the best estimate for the mass of this hammer?

30 grams	300 grams	30 kilograms	300 kilograms
⬭	⬭	⬭	⬭

7 Lyn enlarged a copy of picture A and labelled it picture B.

picture A

picture B

The lengths in picture B are 3 times the lengths in picture A.

How high is the marked height in picture A?

0.9 cm	1.11 cm	1.35 cm	8.1 cm
⬭	⬭	⬭	⬭

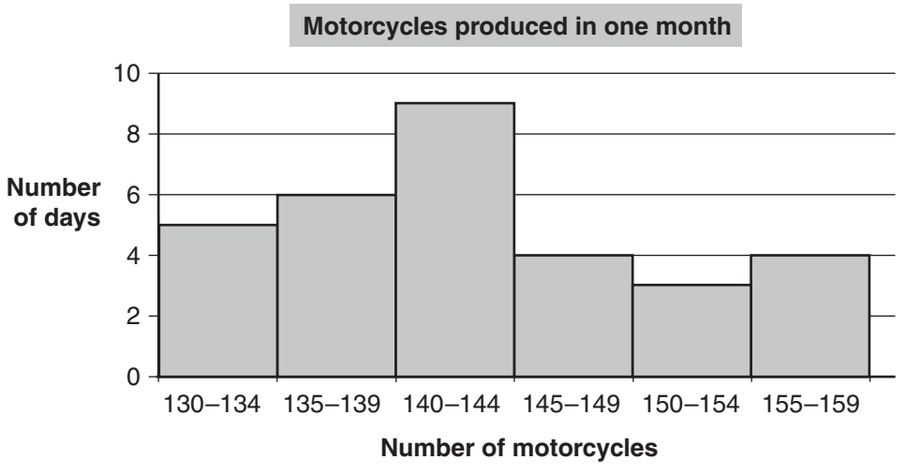
8 In Sandra's school there are 60 teachers and 900 students.

What is the ratio of teachers to students?

Shade one bubble.

1:15 ⬭ 1:16 ⬭ 15:16 ⬭ 30:2 ⬭

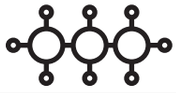
9 This graph shows data on how many motorcycles a factory produced in one month.



On how many days did the factory produce **less** than 140 motorcycles?

5 ⬭ 6 ⬭ 9 ⬭ 11 ⬭

10 Nathan made this pattern of shapes using large and small circles.

Shape			
Large circles	1	2	3
Small circles	4	6	8

He continues the pattern.

How many **small** circles are in Nathan's 14th shape?

12 ⬭ 20 ⬭ 28 ⬭ 30 ⬭

11 A prize of $5934 is shared equally among 15 friends.

How much does each person get in **dollars** and **cents**?

Write your answer in the boxes.

[ ] dollars and [ ] cents

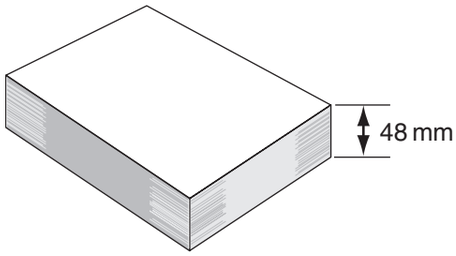
12 The top speed of this wombat is 660 metres per minute.

Shade one bubble.

What is the top speed of the wombat in metres per second?

11	66	110	600
⬭	⬭	⬭	⬭

13 This stack of paper is 48 mm thick.

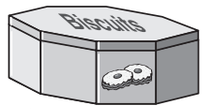


Each sheet of paper in the stack is 0.09 mm thick.

Which value is closest to the number of sheets in the stack?

432	480	500	533
⬭	⬭	⬭	⬭

14 A biscuit tin is in the shape of a **regular** octagonal prism.
The lid is taken off and rotated until it is able to fit back on the tin.



What is the **smallest** number of degrees of rotation that will achieve this?

22.5°	45°	60°	90°
⬭	⬭	⬭	⬭

15 Kiri has to find the value of this expression **without** a calculator.

Shade one bubble.

$20 - 12 \times \sqrt{9.5 + 6.5}$

Which calculation should she do first?

$20 - 12$	$12 \div 9.5$	$\sqrt{9.5}$	$9.5 + 6.5$
⬭	⬭	⬭	⬭

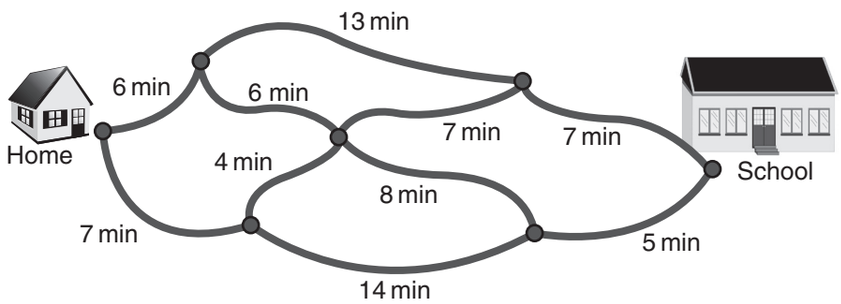
16 This block has 6 faces which are numbered from 1 to 6.
Vicky throws the block 1000 times to test it and records the outcomes.

Number on top face	1	2	3	4	5	6
Frequency	150	360	146	144	68	132

What is the probability of rolling a 2 based on Vicky's results?

$\frac{1}{6}$	$\frac{1}{60}$	$\frac{9}{25}$	$\frac{3}{500}$
⬭	⬭	⬭	⬭

17 Brian's mother drives him to school.
The diagram shows the routes they can take and the travel times.



What is the **shortest** time for Brian to get to school?

23 minutes	24 minutes	25 minutes	26 minutes
⬭	⬭	⬭	⬭

18 An electrician calculates the price of a job using a service fee and an amount **per hour**.
This table shows some of the job prices.

Shade one bubble.

Hours	2	4	5	6
Job price	$160	$252	$298	$344

How are the job prices calculated?

- ○ $80 service fee + $40 per hour
- ○ $80 service fee + $80 per hour
- ○ $68 service fee + $92 per hour
- ○ $68 service fee + $46 per hour

19 Jack is checking the price of four detergents.

Hex detergent
$7.85, 1100 mL

Sun detergent
$5.25, 750 mL

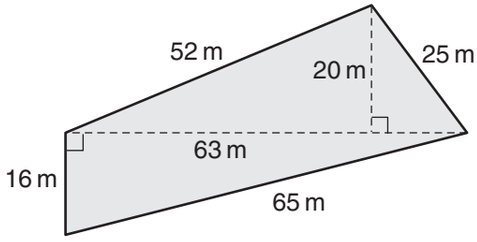
Green detergent
$4.50, 600 mL

Lemon detergent
$4.25, 500 mL

Which detergent is the cheapest per litre?

Hex	Sun	Green	Lemon
○	○	○	○

20 The diagram shows some measurements of a nature reserve.



What is the area of the nature reserve?

158 m^2	936 m^2	1134 m^2	1170 m^2
○	○	○	○

21 Mount St. Helens is a volcano that erupted in 1980.
Before it erupted, it was 2950 m high.
After the eruption, it was 2550 m high.

Shade one bubble.

Mount St. Helens before eruption

Mount St. Helens after eruption

By what percentage of its original height did it decrease after the eruption?

13.6%	15.7%	86.4%	115%
⬭	⬭	⬭	⬭

22 As Mike skydives, the air temperature increases by the same amount every 100 metres.

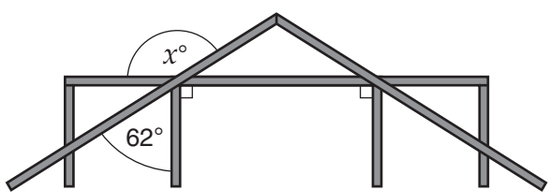
At a height of 5000 metres the temperature is –18 °C.
At ground level the temperature is 22 °C.

What is the air temperature at a height of 2000 metres?

4 °C	6 °C	8 °C	16 °C
⬭	⬭	⬭	⬭

23 The diagram shows part of a roof structure.

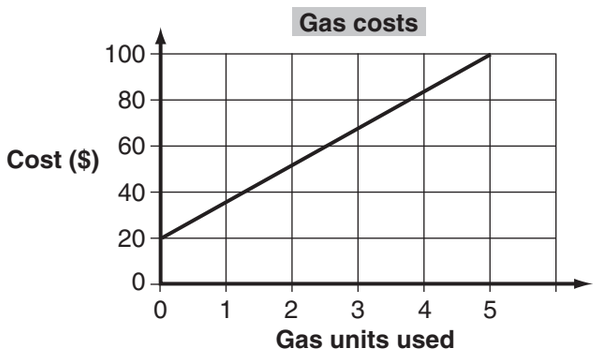
Write your answer in the box.



What is the value of x?

24 This graph shows how to find the cost of the gas used in Jim's house.

Shade one bubble.



The expression to calculate the cost is

- ⬭ 20 + (5 × gas units used)
- ⬭ 20 + (16 × gas units used)
- ⬭ 20 + (20 × gas units used)
- ⬭ 20 + (100 × gas units used)

25 Greg sold one hot dog every 2 minutes at a festival.

At this rate, how many minutes would it take to sell $110 worth of hot dogs?

- ⬭ 25 minutes
- ⬭ 50 minutes
- ⬭ 55 minutes
- ⬭ 100 minutes

26 Jamie surveyed all the Year 7 students at his school about their favourite sport.

Favourite sport	Number of students
Basketball	85
Cricket	35
Football	55
Netball	75

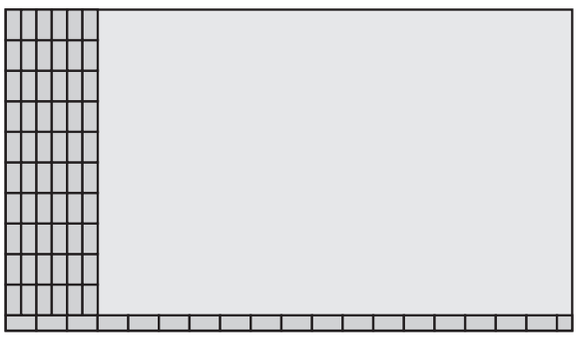
Which sport did 3 out of every 10 Year 7 students choose as their favourite?

Basketball ⬭ Cricket ⬭ Football ⬭ Netball ⬭

27 Dan has started to cover a rectangular floor with tiles.
The tiles are twice as long as they are wide.

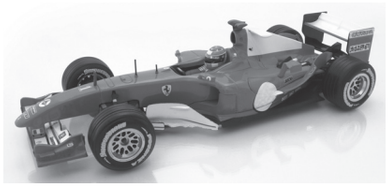
Write your answer in the box.

The floor is $10\frac{1}{2}$ tiles wide and $18\frac{1}{2}$ tiles long.



Using this pattern, what is the **total** number of tiles Dan will use to cover the floor?

28 A racing car used 255 litres of fuel to complete a 340 km race.



On average, how many litres of fuel did the car use every 100 km?

litres per 100 km

29 Amy recorded a set of scores for a netball team.

Shade one bubble.

17, 22, 26, 26, 30, 30, 30, 30, 32, 39, 41, 42

She then included an extra score of 15.

Which of these values would increase?

mean	mode	median	range
⬭	⬭	⬭	⬭

30

Write your answer in the box.

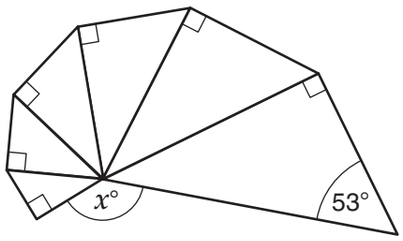
When this car moves forward by 180 cm, each wheel does one full turn.

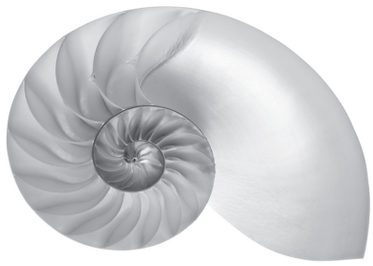
What is the diameter of the wheels to the nearest centimetre?

_____ cm

31

A model of how a shell grows can be made using enlarged copies of the same triangle.
Here is a model.





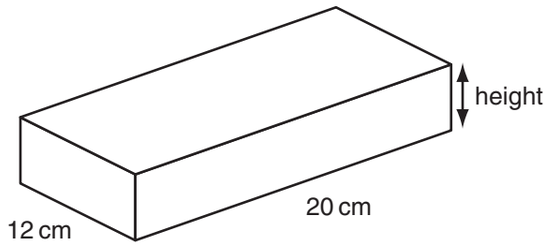
What is the value of x? _____

32

The surface area of a box is given by the rule:

total surface area = 2 × [(*width* × *height*) + (*width* × *length*) + (*height* × *length*)]

The box shown has a total surface area of 768 square centimetres.



What is the **height** of the box? _____ centimetres

STOP – END OF TEST

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NATIONAL ASSESSMENT PROGRAM
LITERACY AND NUMERACY

YEAR
9
2010

NUMERACY
NON-CALCULATOR

SESSION 2

0:40

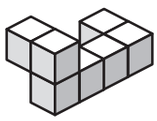
Time available for students to complete test: 40 minutes

Use 2B or HB pencil **only**

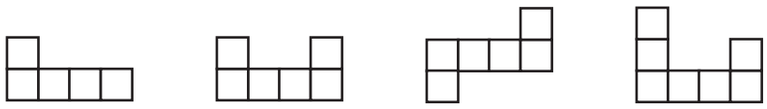
YEAR 9 **NUMERACY (NON-CALCULATOR)**

1 Seven cubes are joined to form the following object.

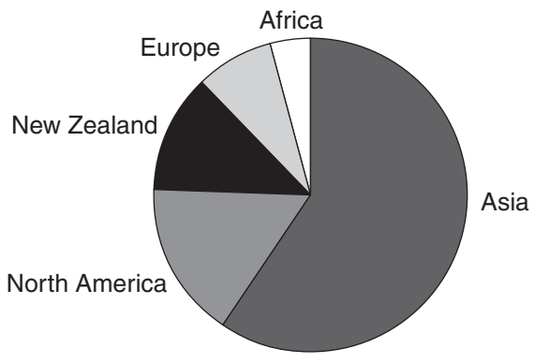
Shade one bubble.



What will the shape look like from above?



2 The diagram shows the proportion of flights to different international regions for an airline.

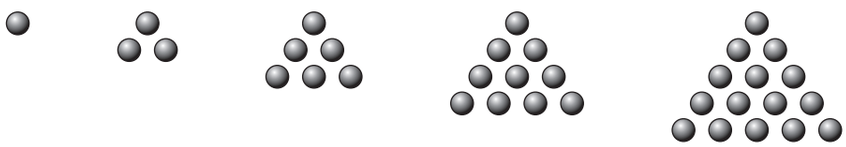


One region makes up about 60% of the airline's flights.

Which region is it?

Asia ○ Europe ○ North America ○ New Zealand ○

3 The first five triangular numbers are 1, 3, 6, 10 and 15.



What is the sixth triangular number?

15 ○ 19 ○ 21 ○ 23 ○

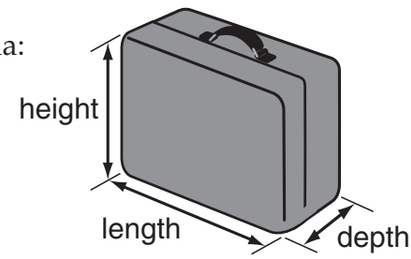
4 Tanya recorded temperatures on a mountain over four days.

Shade one bubble.

Which list gives four temperatures arranged in order from lowest to highest?

- ○ 0 °C, −3 °C, 4 °C, −5 °C
- ○ −3 °C, −5 °C, 0 °C, 4 °C
- ○ −5 °C, 4 °C, −3 °C, 0 °C
- ○ −5 °C, −3 °C, 0 °C, 4 °C

5 An airline calculates the size of bags using this formula:
size = length + depth + height
The size limit for the bags is 110 cm.



Whose bag is over the size limit?

	Passenger	Length (cm)	Depth (cm)	Height (cm)
○	Jake	30	40	40
○	Mary	40	20	45
○	Sanjay	50	20	30
○	Trudy	60	10	45

6 Ryan bought these 4 items.

The total mass of Ryan's items is **closest** to

3 kg	4 kg	8 kg	9 kg
○	○	○	○

7 The picture shows a stone head.

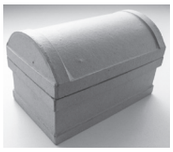
Shade one bubble.

The picture is 3 cm high. The actual head is 60 cm high.

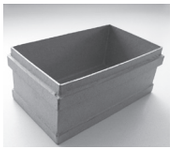
What scale is used in the picture?

- ⬭ 3 cm represents 20 cm
- ⬭ 6 cm represents 30 cm
- ⬭ 1 cm represents 2 cm
- ⬭ 1 cm represents 20 cm

8 With the lid on, the mass of this box is 232 grams.



With the lid off, the mass of the box is 186 grams.



What is the mass of the lid?

46 grams	56 grams	144 grams	154 grams
⬭	⬭	⬭	⬭

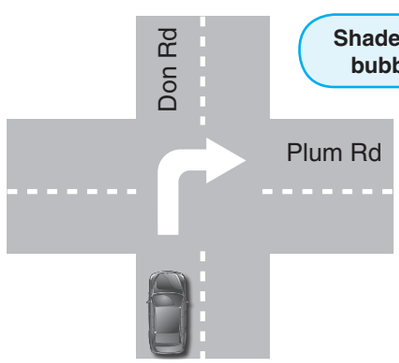
9 A set of traffic lights is red for half the time, orange for $\frac{1}{10}$ of the time and green for the rest of the time.

For what fraction of the time is the set of traffic lights green?

$\frac{1}{3}$	$\frac{2}{5}$	$\frac{6}{10}$	$\frac{10}{12}$
⬭	⬭	⬭	⬭

10 A car is travelling **north-east** along Don Road. The car is about to turn right into Plum Road.

In which direction will the car be travelling **after** it turns right?

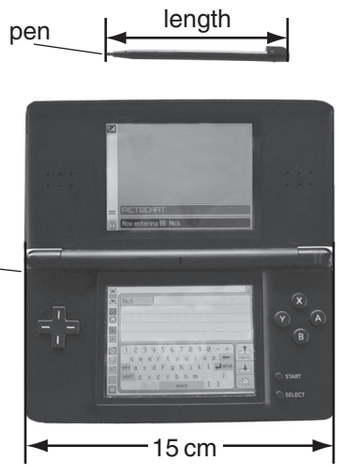


Shade one bubble.

- ○ north-east
- ○ south-west
- ○ north-west
- ○ south-east

11 John's video game comes with a pen. The width of the game is 15 cm as shown.

Which of these measurements is closest to the length of the pen?



- ○ 5 cm
- ○ 6 cm
- ○ 9 cm
- ○ 12 cm

12 Which metric unit would a builder use to measure the volume of sand in a truck like this?

- ○ cubic metres
- ○ square metres
- ○ cubic centimetres
- ○ square centimetres

13 A closed shape has two parallel sides and two other sides of unequal length.

What is the shape?

kite	parallelogram	rectangle	trapezium
○	○	○	○

14 The table shows how the size of computer memory chips has changed over time.

Shade one bubble.

Year	1989	1994	1999	2004	2009	2014
Size (kilobytes)	16	64	256	1024	4096	?

Using this data, what is the best estimate for the size in kilobytes of a computer chip in 2014?

- ⬭ 5000 kilobytes
- ⬭ 8000 kilobytes
- ⬭ 16 000 kilobytes
- ⬭ 32 000 kilobytes

15 Which of these is the longest distance?

0.1203 km	123 m	1230 cm	12 030 mm
⬭	⬭	⬭	⬭

16 This sign shows times that a car can be parked for up to 1 hour.

At which of these times is it permitted to park for 2 hours?

- ⬭ 11:00 am Thursday
- ⬭ 4:00 pm Thursday
- ⬭ 11:00 am Saturday
- ⬭ 4:00 pm Saturday

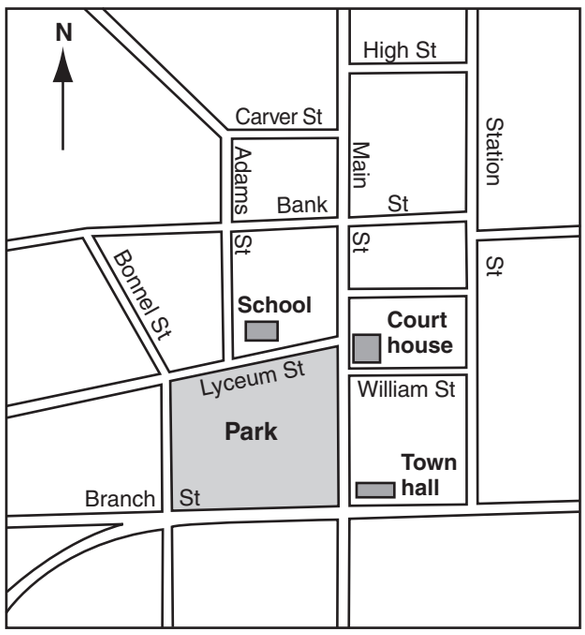
17 Claire thinks of a number, n.
She multiplies the number by itself.
She then halves that answer and subtracts 10.

Which expression shows what Claire did?

$\frac{2n-10}{2}$	$\frac{2n}{2}-10$	$\frac{n^2}{2}-10$	$\frac{n^2-10}{2}$
⬭	⬭	⬭	⬭

18 Jill lives in a street that runs directly north–south.
Her house is north of the park and west of the school.

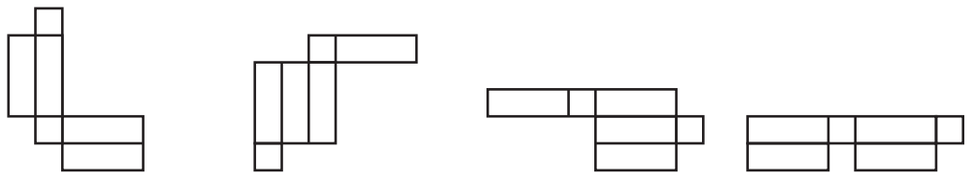
Shade one bubble.



What street does Jill live in?

Adams St ○ Bonnel St ○ Station St ○ Main St ○

19



P Q R S

Only two of these nets form a closed rectangular prism.

Which two nets are they?

- ○ P and R
- ○ P and Q
- ○ Q and R
- ○ R and S

20 In a gym class, 29 students took turns jumping.
Pete recorded the height each student jumped.

Shade one bubble.

Height (cm)

3	2 4
4	1 5 6
5	2 4 4 8 9
6	1 1 3 4 5 6 6 8 9
7	2 2 5 7 8
8	3 5 5
9	1 2

Key: 5 | 2 means 52

What is the median height?

63 cm ⬭ 64 cm ⬭ 65 cm ⬭ 66 cm ⬭

21 In these expressions, p and q are positive whole numbers and r is a positive number less than 1.

Which expression gives the **largest** value?

⬭ $(p + q) \times r$
⬭ $(p + q) \div r$
⬭ $(p - q) \times r$
⬭ $(p - q) \div r$

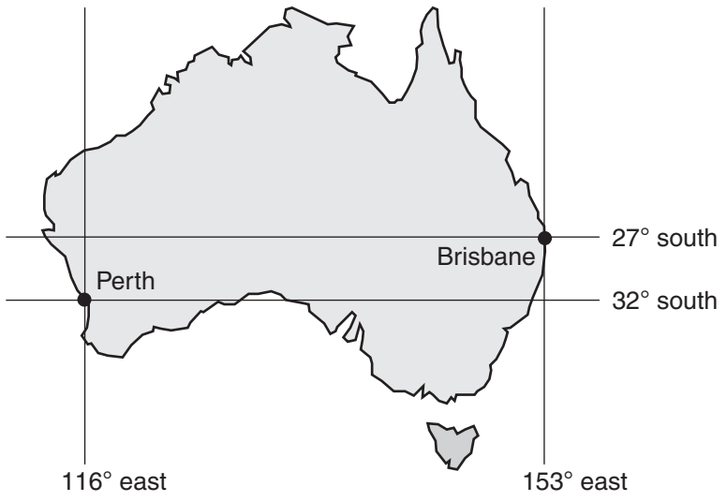
22 A square field has an area of 4000 m^2.

The length of one side is between

⬭ 20 m and 24 m.
⬭ 40 m and 44 m.
⬭ 60 m and 64 m.
⬭ 200 m and 204 m.

23 Brisbane has the latitude and longitude of 27° south, 153° east.

Shade one bubble.

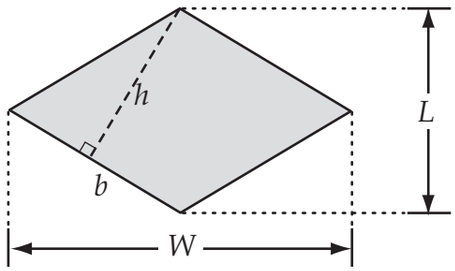


A ship has a latitude and longitude that is 10° north and 5° west of Brisbane.

What is the position of the ship?

- ⬭ 17° south, 148° east
- ⬭ 17° south, 158° east
- ⬭ 37° south, 148° east
- ⬭ 37° south, 158° east

24 This diagram shows four lengths of a rhombus of side length b.



Which equation must be true?

$2hb = LW$	$2hW = Lb$	$hb = 2LW$	$hW = 2Lb$
⬭	⬭	⬭	⬭

25 The relationship between two variables x and y is shown in the table.

Shade one bubble.

x	0	–1	–2	–3
y	1	3	9	19

Which equation best describes the relationship between x and y?

$y = 1 - 2x^2$ ⬭ $y = 2x + 1$ ⬭ $y = 2x^2 + 1$ ⬭ $y = 1 - 2x$ ⬭

26 The population of India is approximately 10^9 people.
The population of Mexico is approximately 10^8 people.

Approximately how many **more** people live in India than Mexico?

10 million ⬭ 90 million ⬭ 100 million ⬭ 900 million ⬭

27 This Ferris wheel turns at a constant speed.
It takes 4 minutes to turn through a complete circle.

Write your answer in the box.

What angle does the Ferris wheel turn through in 90 seconds? ☐ °

28 Ben has 2 identical pizzas.
He cuts one pizza equally into 4 large slices.
He then cuts the other pizza equally into 8 small slices.
A large slice weighs 32 grams more than a small slice.

What is the mass of **one** whole pizza?

☐ grams

29 The height of a door is 210 cm.

Darren is $\frac{5}{6}$ of the height of the door.

What is Darren's height?

Write your answer in the box.

[ ] cm

30 Alex collected some eggs from his hens.
Exactly 35% of the eggs were brown.

What is the smallest total number of eggs that he could have collected?

[ ]

31 Helen's office has a security alarm.
To turn it off Helen has to type her 4-digit code into this keypad.

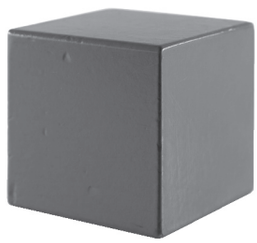
Helen's code is 0051.

Including Helen's code, how many different 4-digit codes are possible?

[ ]

32 The total surface area of a cube is 600 cm^2.

How long is an edge of the cube?



[ ] cm

STOP – END OF TEST