International Benchmark Tests in English, Mathematics & Science

Student Name		
Gender	Date of Birth	
Subject	**MATHEMATICS**	Student ID **N0006**
School Name	**TOWHEED IRANIAN SCHOOL**	
Grade	**08**	Section

168-M-N0006-08-1   2081

Mathematics

TEST INSTRUCTIONS

FILL IN YOUR DETAILS

Turn to your ANSWER SHEET and fill in your name, school, grade, section, today's date, your date of birth and gender.

ANSWERING QUESTIONS

Go to the MATHEMATICS ANSWER SHEET.

This test has **45 QUESTIONS**. Each question has four possible options.

Choose the BEST answer from the four options, **A, B, C** or **D**.

FILL in ONE circle on your answer sheet with a pencil.

If you make a mistake, erase the pencil mark and fill in a different circle.

You must colour the entire circle as shown below:

Correct response	Incorrect responses			
● ✓	Line	Very light pencil	Pen	Colored pencil

Marks are NOT deducted for incorrect answers.

ALL ANSWERS SHOULD BE MARKED ON YOUR ANSWER SHEET ONLY.

EQUIPMENT ALLOWED IN THIS TEST

You may use a 2B or B pencil for this test. You may NOT use a calculator for this test.

TIME ALLOWED FOR TEST

The time allowed to complete this test is **60 minutes**.

1 A fair dice has:

- three black faces
- two white faces
- one red face.

The dice is rolled once.

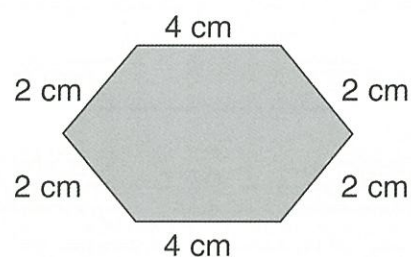What is the probability of getting **either** a black **or** a white face?

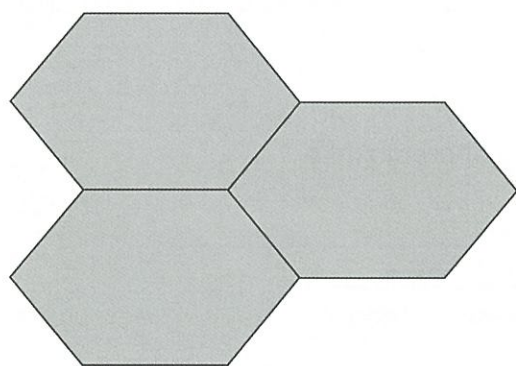| $\frac{1}{5}$	$\frac{1}{3}$	$\frac{2}{3}$	$\frac{5}{6}$
A	**B**	**C**	**D**

2 A student has identical hexagons like this.

not to scale

He joins three of these hexagons together, with no overlap, to make a new shape like this.
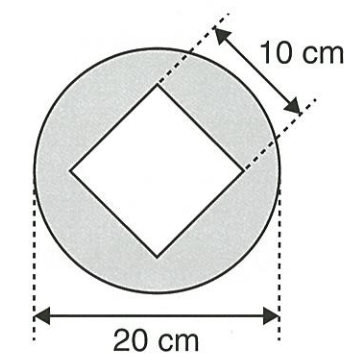

What is the perimeter of the new shape?

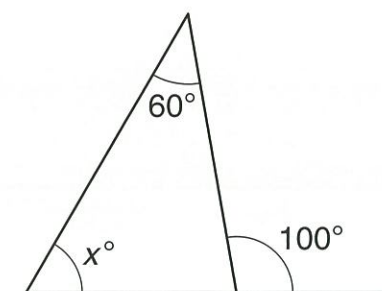| 32 cm	40 cm	48 cm	56 cm
A	**B**	**C**	**D**

42 This design shows a square inside a circle.

What is the shaded area?

- **A** 100 cm²
- **B** 214 cm²
- **C** 314 cm²
- **D** 1157 cm²

43 What is the value of x?

- **A** 40
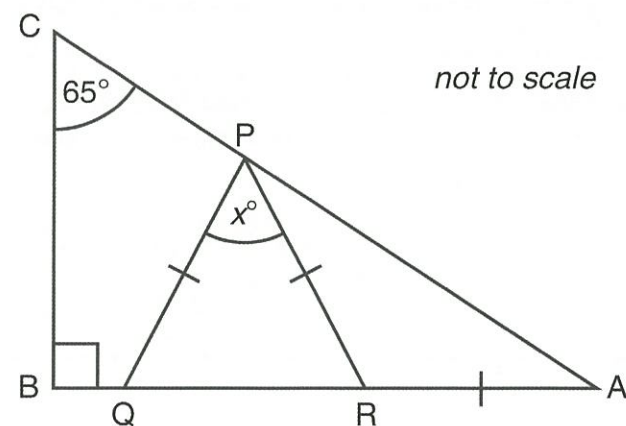- **B** 50
- **C** 60
- **D** 80

44 The library is 36 m away from the gym.
On a map, 2 cm represents 3 m.

On the map, how far apart are the gym and the library?

- **A** 6 cm
- **B** 12 cm
- **C** 18 cm
- **D** 24 cm

45 Line segments AR, PQ and PR are of equal length.

not to scale

What is the value of x?

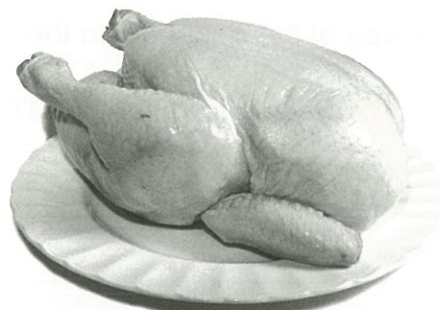| 25	50	77.5	80
A	**B**	**C**	**D**

38

Onions 500 grams   Chicken 1.5 kg   Tomatoes 600 grams

What is the total weight of these items?

1.25 kilograms	1.61 kilograms	2.6 kilograms	12.5 kilograms
A	**B**	**C**	**D**

39 $3m - 6 = 39$

What is the value of m?

7	9	11	15
A	**B**	**C**	**D**

40 There are 10 marbles in a bag: 5 red and 5 blue.

Sue draws a marble from the bag at random. The marble is red.

She puts the marble back into the bag.

What is the probability that the next marble she draws at random is red?

$\frac{1}{2}$	$\frac{4}{10}$	$\frac{1}{5}$	$\frac{1}{10}$
A	**B**	**C**	**D**

41 A packet contains pens of three different colours.
There are 5 times as many blue pens as red pens.
There are 3 times as many green pens as red pens.

Which of these numbers could be the number of pens in the packet?

8	10	16	18
A	**B**	**C**	**D**

3 A group of adults were asked, "Do you have a driver's licence?"
This table shows the results.

	Yes	No
Males	80	5
Females	50	15

One person is selected at random from the group.

What is the probability of the person being a male **without** a driver's licence?
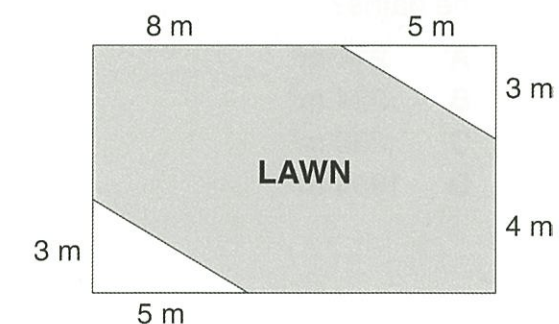
$\frac{5}{20}$	$\frac{5}{80}$	$\frac{5}{145}$	$\frac{5}{150}$
A	**B**	**C**	**D**

4 This is a diagram of a rectangular garden.

What is the area of the lawn?

A   17 m²
B   32 m²
C   61 m²
D   76 m²

5 In a game, John rolls a fair six-sided dice and tosses a fair coin.

What is his probability of getting a 3 and a tail?

$\frac{1}{6}$	$\frac{1}{8}$	$\frac{2}{3}$	$\frac{1}{12}$
A	**B**	**C**	**D**

6 Here are the scores of a player in 10 games.

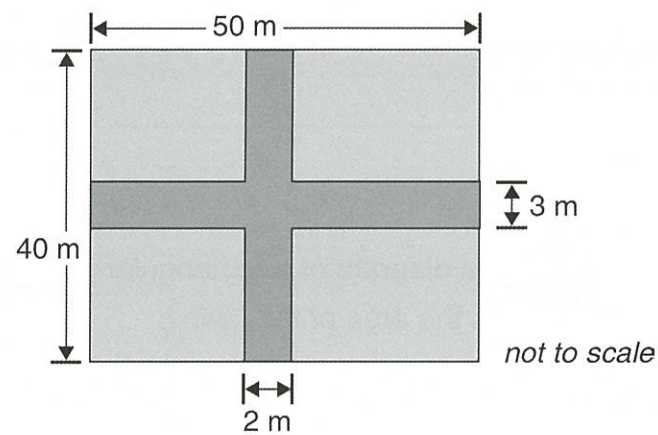4, 8, 14, 15, 10, 4, 9, 6, 13, 7

What is the mean of these scores?

4	8.5	9	11
A	**B**	**C**	**D**

7 A rectangular park has two paths running through it.

The paths run parallel to the sides of the park.

What is the total area taken up by the paths?

A 214 m²
B 224 m²
C 230 m²
D 1994 m²

50 m

40 m

3 m

2 m

not to scale

8 John walks at 5 km per hour.
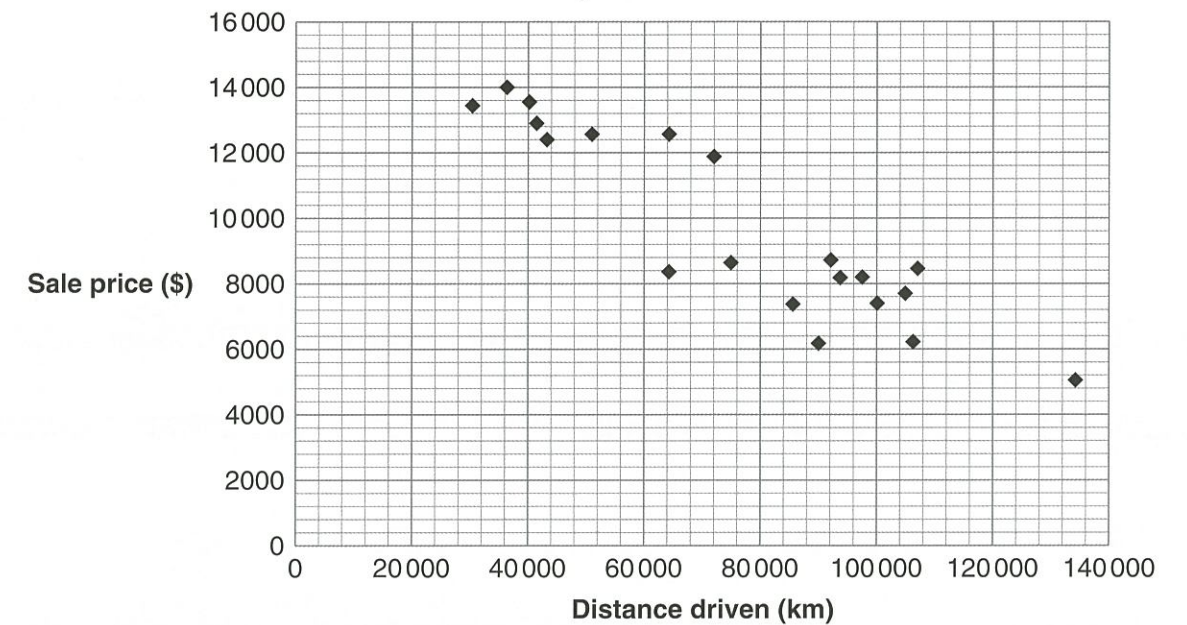He cycles at 15 km per hour.
John lives 3 km from school.

How much longer does it take John to walk to school than to cycle to school?

A 12 minutes
B 18 minutes
C 24 minutes
D 36 minutes

36 The sale price of a particular type of car depends on the distance it has been driven.

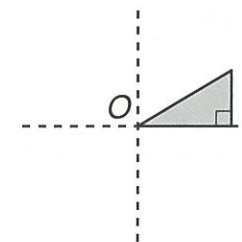**Sale prices for 20 *IBT* cars**

Sale price ($)

Distance driven (km)

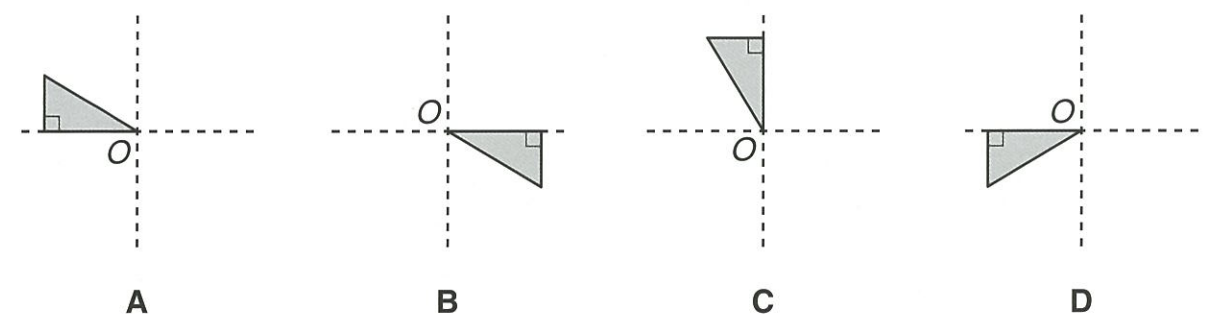Toshi's *IBT* car has been driven 60 000 kilometres.

Using this data, approximately what sale price can Toshi expect for his *IBT* car?

A $5000
B $11 000
C $60 000
D $89 000

37 The triangle is rotated one half-turn about point *O*.

Which diagram shows the new position of the triangle?

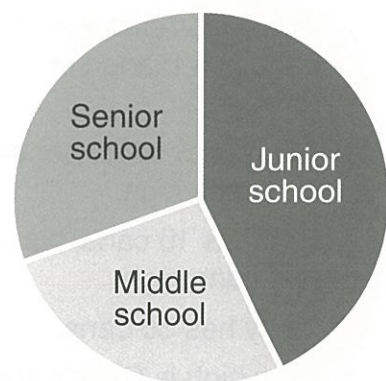**A**   **B**   **C**   **D**

32 This pie chart shows the distribution of students at Tigerheads College.
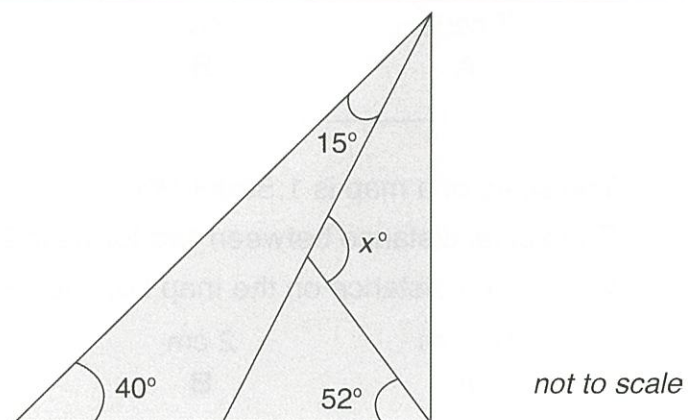
There are 200 students in the middle school.

About how many students are there in the junior school?
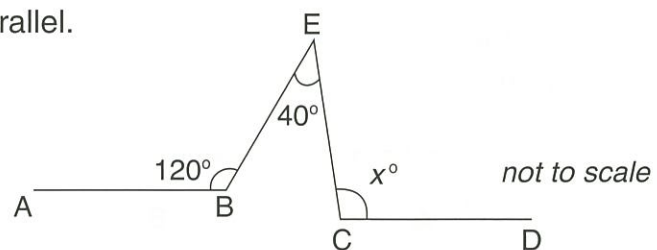
- A 250
- B 300
- C 350
- D 400

Senior school

Junior school

Middle school

33 What is the value of x?

- A 73
- B 107
- C 113
- D 253

15°

$x°$

40°   52°

not to scale

34 In this diagram, lines AB and CD are parallel.

What is the value of x?

- A 80
- B 100
- C 140
- D 160

E

40°

120° $x°$ *not to scale*
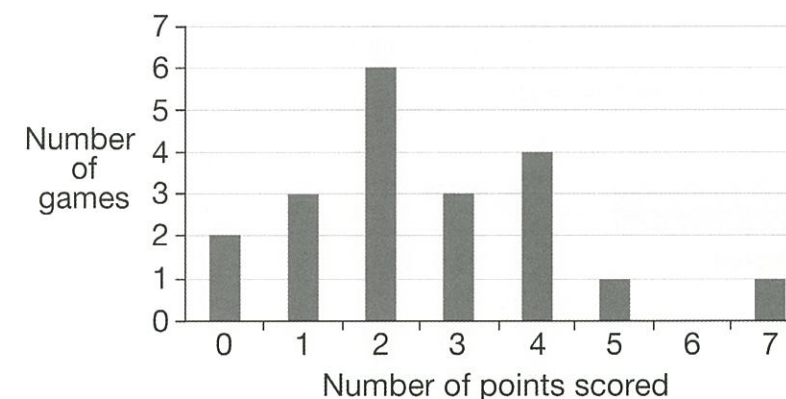
A   B

C   D

35 What is the temperature shown on this gauge?

- A 23 °C
- B 23.5 °C
- C 26.5 °C
- D 27 °C

20

10   30

0   40

°C
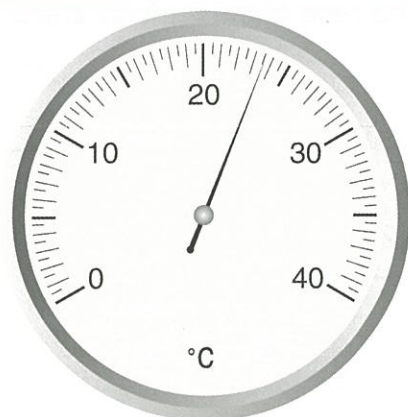
9 This chart shows the points scored by a polo player in 20 different games.

Number of games

Number of points scored

How many points did the player score altogether?

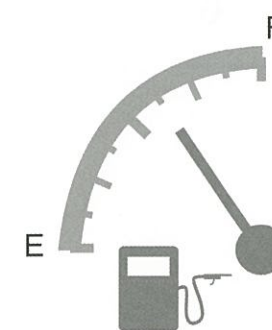| 20	22	44	52
A	B	C	D

10 What is 3^4 equal to?

- A 3×4
- B $4 + 4 + 4$
- C $3 + 3 + 3 + 3$
- D $3 \times 3 \times 3 \times 3$

**11** A car starts a journey with a full tank of fuel.

After 180 kilometres the display shows this reading.

F

E

About how many more kilometres can the car be driven on this tank of fuel?

108	180	270	300
A	B	C	D

12 A SONAR on a ship sends a signal to the ocean floor and receives the reflected signal.

The speed of the signal in water is 1400 metres per second.

The ocean floor is 7 kilometres below the ship.
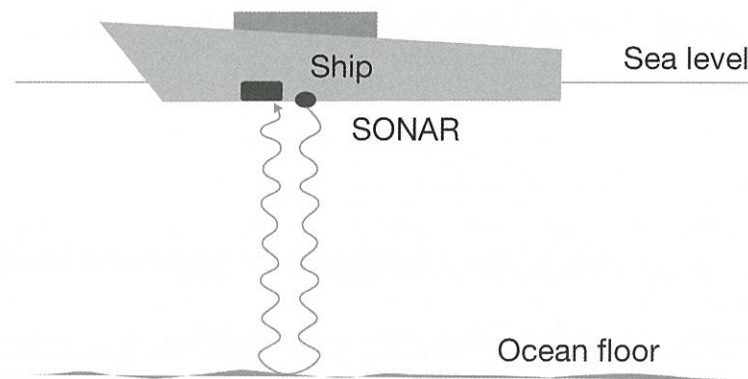
How long will the signal take to go to the ocean floor and come back to the ship?

- **A** 0.2 seconds
- **B** 5 seconds
- **C** 10 seconds
- **D** 100 seconds

13 A car is moving at a speed of 36 kilometres per hour.
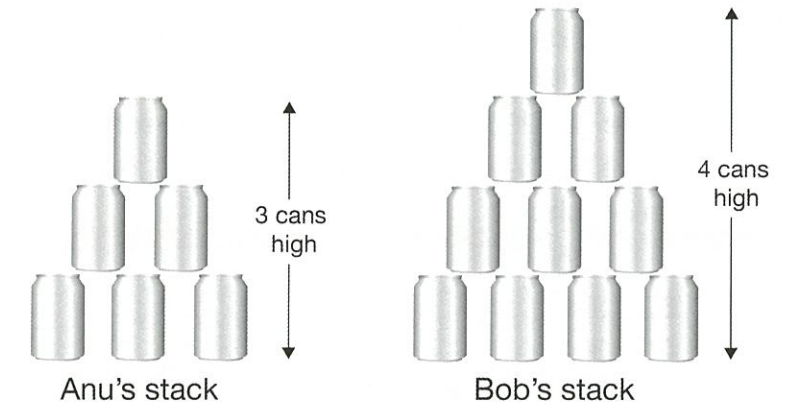
What is the speed of the car in metres per second?

60	10	1	$\frac{1}{100}$
A	**B**	**C**	**D**

14 $6(a + 3)$ is equivalent to

- **A** $6a + 3$
- **B** $6 + a + 3$
- **C** $a + 18$
- **D** $6a + 18$

28 Three students are stacking cans in a triangular formation.

Anu has 6 cans, her stack is 3 cans high.

Bob has 10 cans, his stack is 4 cans high.

Carly has 36 cans.

How high is Carly's stack?

7 cans	8 cans	9 cans	18 cans
A	**B**	**C**	**D**

29 The scale of a map is 1:50 000 000.

The actual distance between two towns is 250 km.
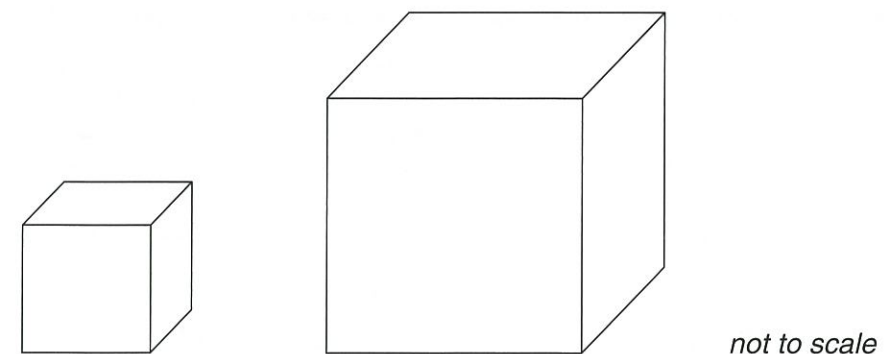
What is the distance on the map between the two towns?

0.5 cm	2 cm	5 cm	50 cm
A	**B**	**C**	**D**

30 $2(x + a) = b$

What is x?

$x = 2b - a$	$x = \frac{b}{2} - a$	$x = \frac{b}{2} + a$	$x = \frac{b - a}{2}$
A	**B**	**C**	**D**

31 The ratio of the surface areas of these cubes is 1:4.

not to scale

What is the ratio of their volumes?

1:64	1:8	1:4	1:2
A	**B**	**C**	**D**

25 This large piece of card will be cut into rectangular postcards measuring 17 cm × 10 cm.

125 cm

90 cm   90 cm

not to scale

125 cm
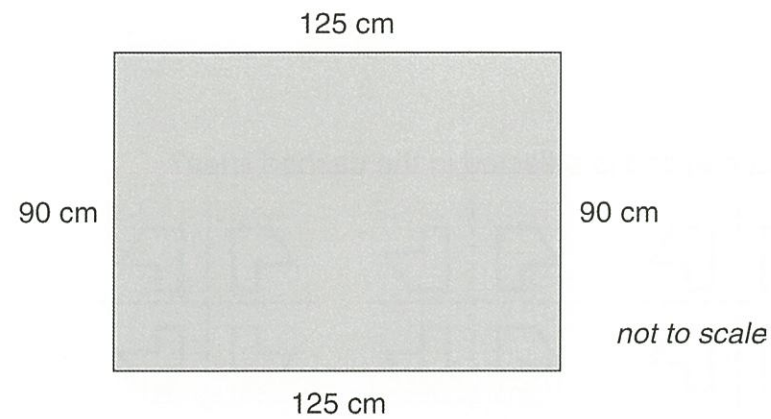
What is the largest number of postcards that can be cut out?

60	63	66	67
A	**B**	**C**	**D**

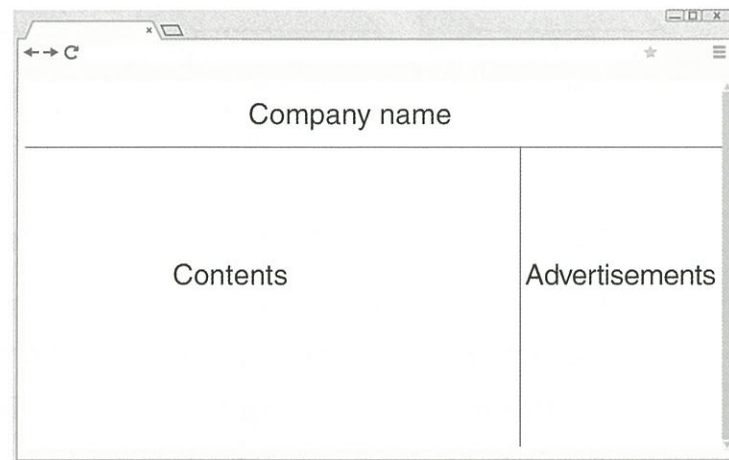**26** This diagram shows the layout of a webpage.

The top 20% of the page is used for the company name.

Of the remaining area, 25% must be used for advertisements.

What percentage of the whole webpage is used for the contents?

Company name

Contents   Advertisements

45%	55%	60%	80%
A	**B**	**C**	**D**

27 These two statements are both true.

$3p = 2m$

$4p = 5s$

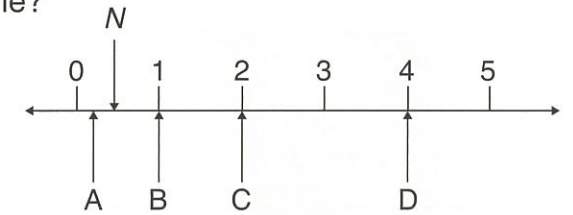Which of the following is true?

$7p = 7ms$	$6mp = 8ps$	$6mp = 20ps$	$12p^2 = 10ms$
A	**B**	**C**	**D**

15 N is a number shown on this number line.

Where should N^2 be marked on the number line?

A point A
B point B
C point C
D point D

N

0   1   2   3   4   5

A   B   C   D

16 The price of a can of cooking oil is increased by 20%.

The new price is $48.

What was the price of the cooking oil before the increase?

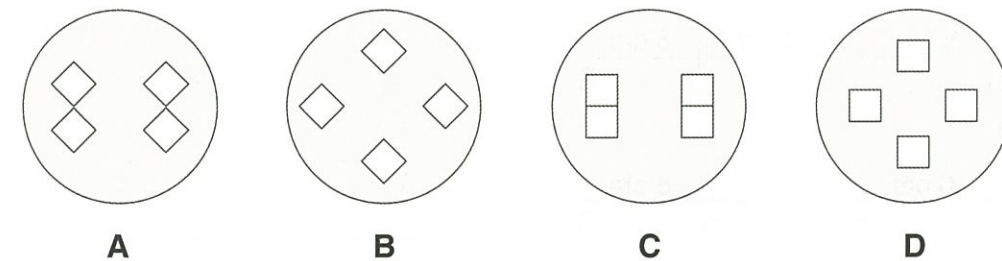| $20	$28	$38.40	$40
A	**B**	**C**	**D**

17 A circular paper is folded in half.

It is folded in half again, and a small square is cut from the middle of the bottom edge.
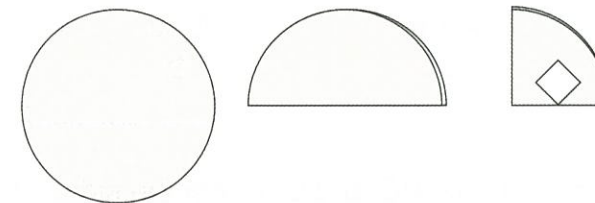
The circular paper is unfolded.

How will the unfolded paper look?

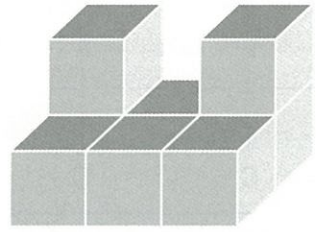| A	B	C	D

18 A mother's age is x years.

Her son's age is 5 years more than one-third of her age.

The sum of their ages is 65 years.

What is the mother's age in years?

45	47.5	50	52.5
A	**B**	**C**	**D**

19 This model is made by gluing together 8 cubes.
Each cube is a cubic centimetre.

What is the outside surface area of the model, **including** the base?

15 cm²	30 cm²	42 cm²	48 cm²
A	**B**	**C**	**D**

20 This is the formula to calculate the dose (D) in ml of a particular medicine for a child x years of age.

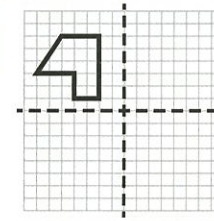$$D = \frac{60x}{x + 10}$$

What is the dose for a 5-year-old child?

$\frac{121}{3}$ ml	20 ml	12.1 ml	6 ml
A	**B**	**C**	**D**

21 Four wires are bent at points P and Q so that OP, PQ and QR form the sides of a triangle.

Which wire will **not** form a triangle?

A O —— 8 cm —— P — 5 cm — Q — 5 cm — R

B O — 6 cm — P — 6 cm — Q — 6 cm — R

C O —— 8 cm —— P —— 7 cm —— Q — 3 cm — R

D O ——— 10 cm ——— P — 4 cm — Q — 4 cm — R

22

Which option shows the shape after it is reflected in the dashed lines?
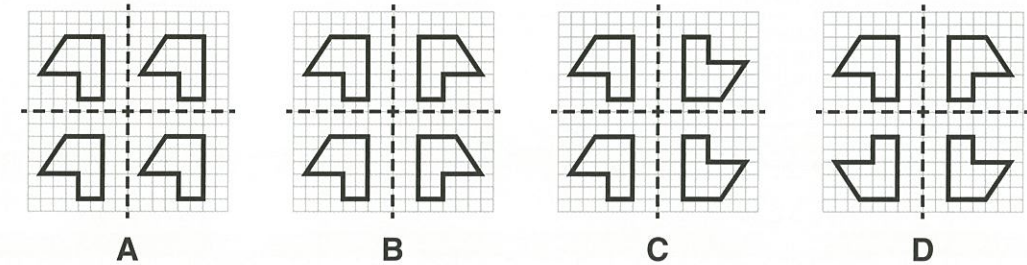
| **A** | **B** | **C** | **D** |

23 Each of these boxes contains ten cards as shown:

Box A	Box B	Box C	Box D
Cards numbered 1 to 10	Cards numbered 11 to 20	Cards numbered 21 to 30	Cards numbered 31 to 40
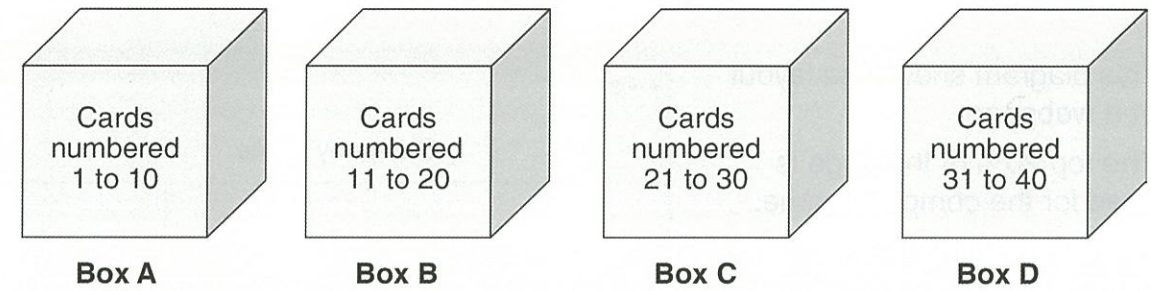
A card is randomly drawn from one of the boxes.

In which box is there the greatest chance of drawing a card that is a multiple of 7?

Box A	Box B	Box C	Box D
A	**B**	**C**	**D**

24 This table shows the time spent by Alex on various activities in one day.

Activity	Time spent in hours
Sleeping	8
Studying	10
Playing	2
Watching TV	1
Others	3

Alex will draw a pie chart of the information in the table.

What angle is needed for the sector on Studying?

10°	36°	150°	240°
A	**B**	**C**	**D**