International Benchmark Tests in English, Mathematics & Science

Student Name		
Gender		Date of Birth
Subject	**MATHEMATICS**	Student ID **N0007**
School Name	**TOWHEED IRANIAN SCHOOL**	
Grade	**09**	Section

168-M-N0007-09-1   2091

International Benchmark Tests in English, Mathematics & Science

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
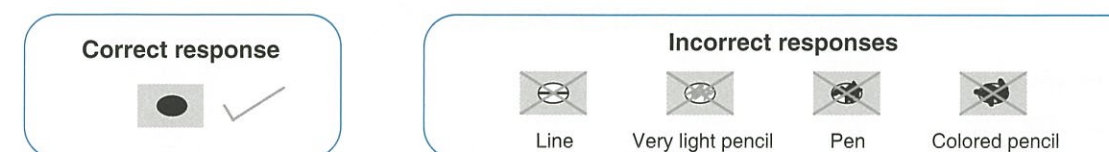
Marks are NOT deducted for incorrect answers.

ALL ANSWERS SHOULD BE MARKED ON YOUR ANSWER SHEET ONLY.
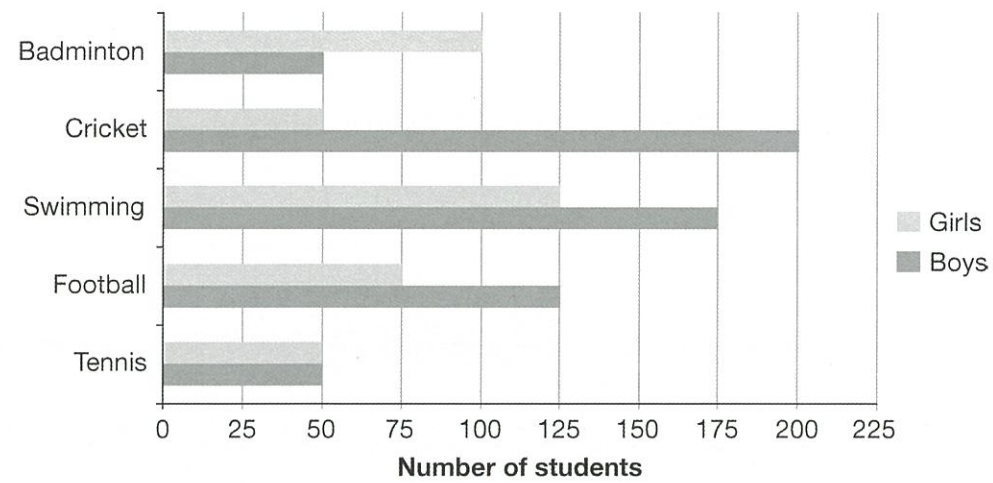
EQUIPMENT ALLOWED IN THIS TEST

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 This chart shows the number of students playing different sports in a school.
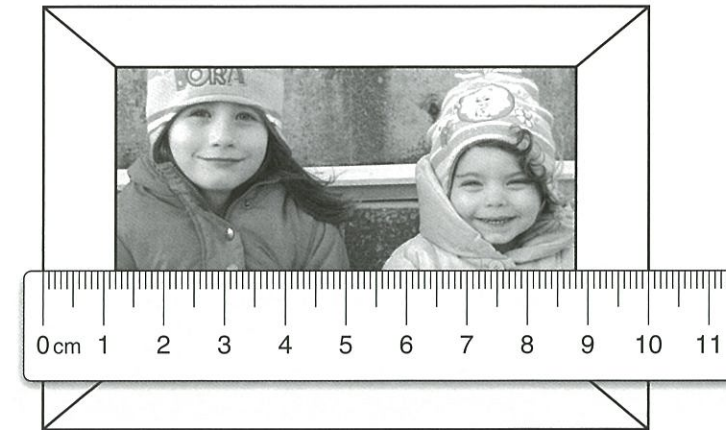
Each student takes part in only one sport.

One student is selected at random from the swimming group.

What is the probability of this student being a girl?

$\frac{125}{300}$	$\frac{125}{400}$	$\frac{175}{300}$	$\frac{125}{1000}$
A	**B**	**C**	**D**

2 The power, P kilowatts, of an air conditioner needed to cool a house depends on its volume, V cubic metres.

The formula is $P = 0.16 \times V$.

A house has a floor area of 100 square metres, and its ceilings are 3 metres high.

What is the power of an air conditioner needed for this house?

A   0.3 kilowatts
B   4.8 kilowatts
C   16 kilowatts
D   48 kilowatts

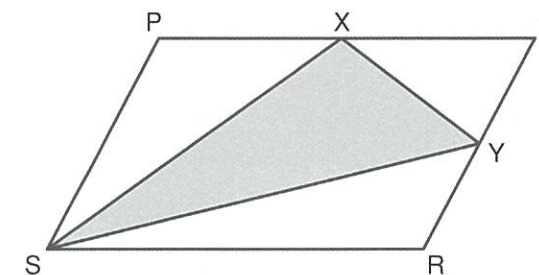**43** The frame for this photo is 10 cm wide.

What is the width of the photo?

7.6 cm	7.8 cm	8.6 cm	8.8 cm
A	**B**	**C**	**D**

44 What is the value of $2\frac{2}{3} \times 2\frac{1}{2}$?

$4\frac{1}{3}$	$5\frac{1}{6}$	$5\frac{1}{3}$	$6\frac{2}{3}$
A	**B**	**C**	**D**

45 PQRS is a parallelogram. X is the midpoint of PQ and Y is the midpoint of QR.

What fraction of the parallelogram is shaded?

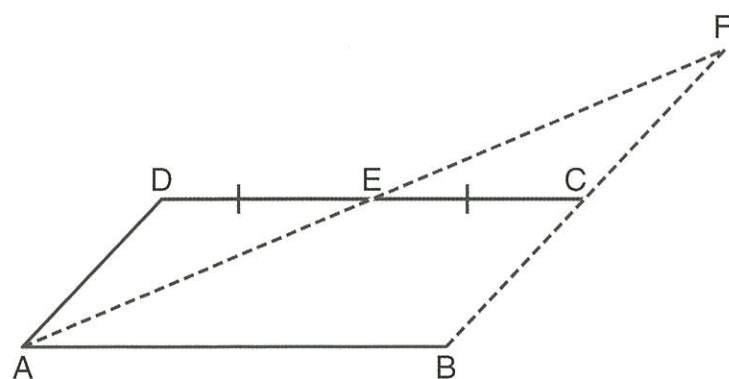| $\frac{1}{2}$	$\frac{1}{3}$	$\frac{3}{5}$	$\frac{3}{8}$
A	**B**	**C**	**D**

40 The table shows the dietary habits of a group of men and women.

	Vegetarian	Not vegetarian
Men	5	17
Women	15	13

What is the probability that a person chosen at random is a woman who is vegetarian?

0.15	0.30	0.56	0.75
A	**B**	**C**	**D**

41 ABCD is a parallelogram. E is the mid-point of CD.

AE and BC when extended meet at point F.

How does the area of triangle ABF compare with the area of parallelogram ABCD?

A The area of the triangle is smaller.

B The area of the triangle is greater.

C The area of the triangle is the same as the parallelogram.

D There is not enough information to determine the areas.

42 A photo measures 15 cm × 10 cm.
Its length and width are both reduced by 40%.

What is the new length?

A 5.4 cm

B 6 cm

C 9 cm

D 11 cm

← length = 15 cm →

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?

$\dfrac{5}{20}$	$\dfrac{5}{80}$	$\dfrac{5}{145}$	$\dfrac{5}{150}$
A	**B**	**C**	**D**

4 A customer buys x apples at a cost of 30 cents each.

The customer buys 5 more apples than oranges. The oranges cost 25 cents each. The total cost is \$4.25.

Which equation matches this situation?

A $0.3x + 0.25(x - 5) = 4.25$

B $0.3x + 0.25(x + 5) = 4.25$

C $30x + 25(x - 5) = 4.25$

D $(30 + 25)(x + x - 5) = 4.25$

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

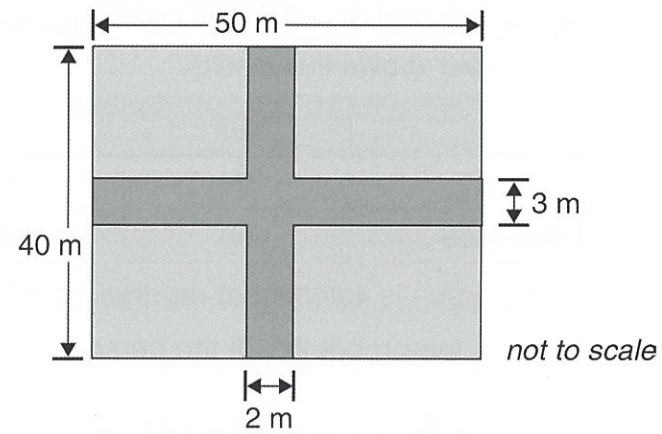4, 8, 14, 15, 10, 4, 9, 6, 13, 7

What is the mean of these scores?

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

6 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

not to scale

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7 At a helpdesk, the operator gets a phone call on average once every 10 minutes.

Li starts his job at the helpdesk at 2:00 pm and works until 6:30 pm.

How many calls would Li expect to get during that time?

6	10	27	33
A	B	C	D

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8 The speed of 700 vehicles on a section of a highway were recorded for one hour. This chart shows the results recorded.
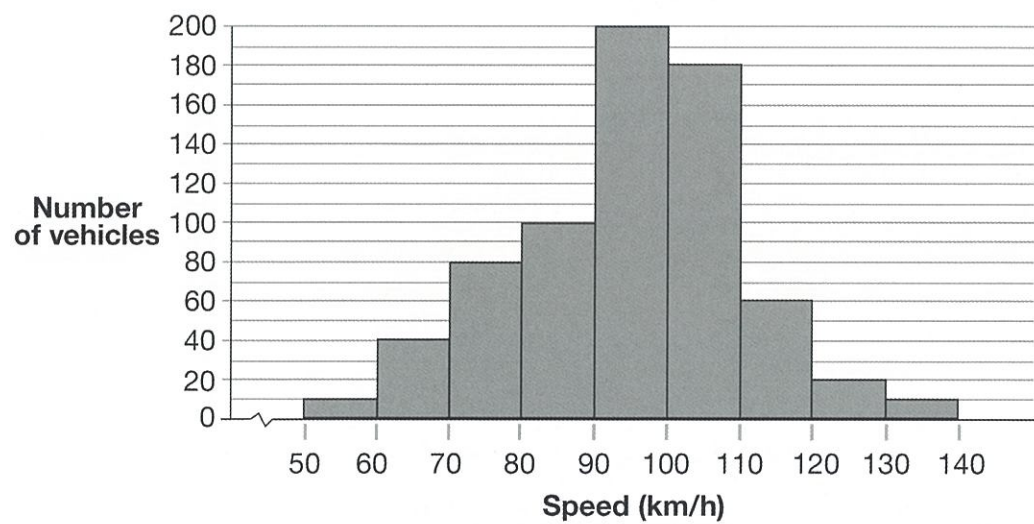
About what percentage of vehicles were recorded with a speed of 100 km/h or above?

12%	39%	67%	90%
A	B	C	D

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37 This diagram shows a square and four triangles.
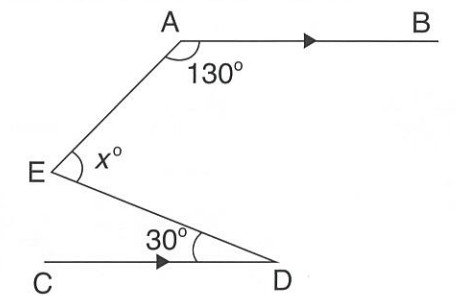
Each triangle has two angles equal to 35°.
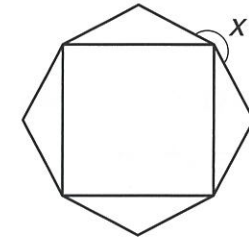
What is the size of the angle marked x?

160°	180°	190°	200°
A	B	C	D

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38 In this diagram, AB and CD are parallel.

What is the value of x?

A 50
B 80
C 100
D 160


39 The following nutritional information is printed on a 420 g box of Seedi Bars.

	per serve	% RDI per serve	per 100 g
Energy	588 kJ	7.3%	1680 kJ
Protein	2.6 g	5.7%	7.5 g
Fat	4.6 g	7.1%	13.2 g
Carbohydrate	22.2 g	7.2%	58.4 g

According to this information, what is the recommended daily intake (RDI) of fat?

4.6 g	7.1 g	13.2 g	64.8 g
A	B	C	D

33 The length of this rectangular park is 250 metres.

The perimeter of the park is P metres.

250 metres

PARK w metres
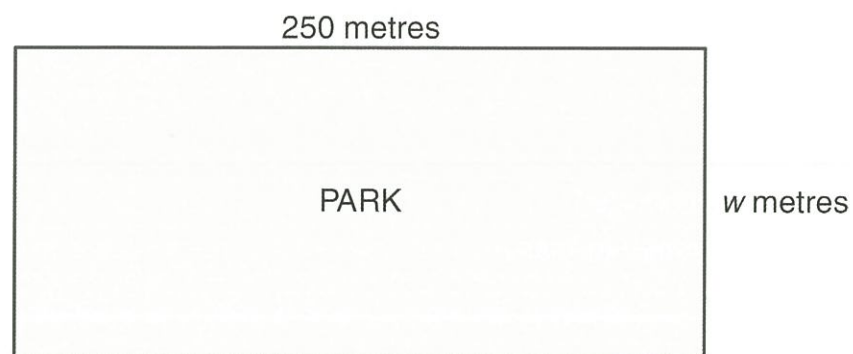
Which calculation **cannot** give the width (w) of the park in metres?

$w = \dfrac{P}{2} - 125$ $w = \dfrac{P}{2} - 250$ $w = \dfrac{1}{2}(P - 500)$ $w = \dfrac{P - 500}{2}$

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

34
$6h + 7c = 42$
$5h + 6c = 30$

$h + c =$

−30	12	42	72
A	**B**	**C**	**D**

35 $0.2^3 =$

0.6	0.8	0.006	0.008
A	**B**	**C**	**D**

36 The base of a prism has three edges.

How many faces does it have?

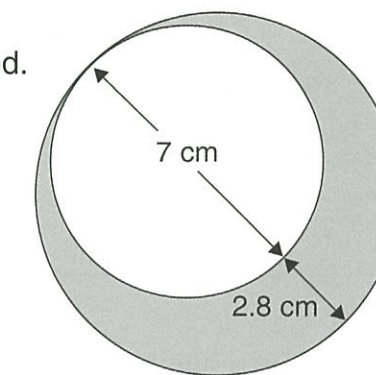| 4	5	6	9
A	**B**	**C**	**D**

9 Forty students were asked which activities they enjoy doing.

How many students chose more than one activity?

A 2
B 12
C 14
D 18
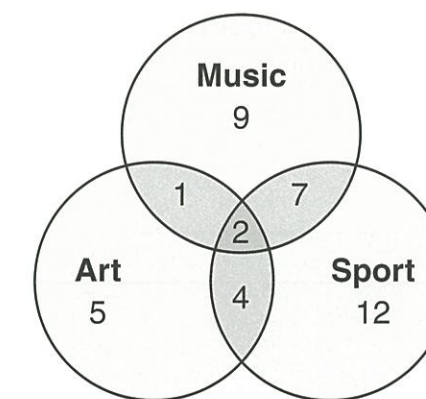
10 In this diagram, the lengths along the diameters are marked.

Which calculation gives the area of the shaded portion?

A $\pi \times (4.9 - 3.5)^2$
B $\pi \times (4.9^2 - 3.5^2)$
C $\pi \times (7^2 - 2.8^2)$
D $\pi \times (9.8^2 - 7^2)$

11 Follow these instructions:

- start with x
- add 4
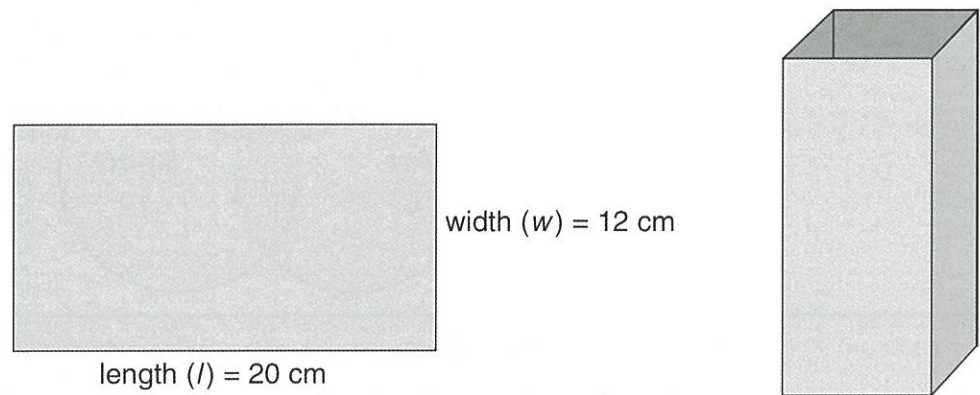- double the result
- now subtract 2
- then halve the result

What expression gives the result?

$x + 1$	$x + 3$	$x + 4$	$x + 8$
A	**B**	**C**	**D**

12 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	$\dfrac{1}{100}$
A	**B**	**C**	**D**

13 A sheet of cardboard is folded along its length (*l*) to make a hollow square-based cuboid as shown.

width (*w*) = 12 cm
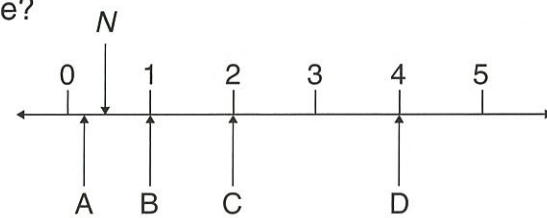
length (*l*) = 20 cm

What is the volume of the space inside the cuboid?

60 cm³	240 cm³	300 cm³	4800 cm³
A	**B**	**C**	**D**

14 *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

15 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**

30 In a group of zebras, there are twice as many females as males.

10 more female zebras and 10 more male zebras are added to the group.

How does this affect the probability of selecting a male zebra at random from the new group?

A   The probability increases.
B   The probability decreases.
C   The probability remains unchanged.
D   There is not enough information to know.

31 This is the number of goals scored by Zola in 9 hockey matches.

6, 0, 3, 7, 3, 0, 6, 5, 6

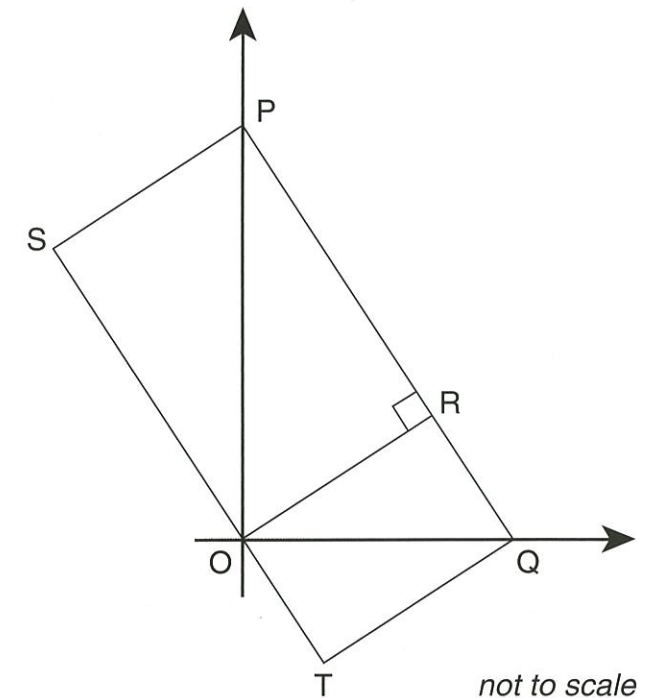What is the median number of goals scored?

6	5	4	3
A	**B**	**C**	**D**

32 Δ POQ is **similar** to Δ ORQ.
P is 20 cm from point O.
Q is 15 cm from point O.

How far is point R from point O?

A   12 cm
B   12.5 cm
C   17.5 cm
D   25 cm

not to scale

26 This is how disk space is measured in computers.

1 kilobyte (Kb) = 10^3 bytes
1 megabyte (Mb) = 10^3 kilobytes

How many bytes can be stored on 1 Mb of disk space?

10^{3+3}	$10^{3\times3}$	20^{3+3}	$20^{3\times3}$
A	**B**	**C**	**D**

27 A student is downloading a movie.
This diagram shows the status of the download.

80% complete	

So far, 440 megabytes (Mb) has downloaded.

What is the size of the movie?

352 Mb	550 Mb	792 Mb	800 Mb
A	**B**	**C**	**D**

28 A phone has the dimensions 140 mm × 70 mm × 7 mm.
Its packaging box has the internal dimensions 155 mm x 90 mm × 60 mm.
The unused space is for other accessories.

Which calculation gives the space available for accessories?

A $(155 - 140) \times (90 - 70) \times (60 - 7)$
B $155 \times 90 \times 60 + 140 \times 70 \times 7$
C $(155 - 140) + (90 - 70) + (60 - 7)$
D $155 \times 90 \times 60 - 140 \times 70 \times 7$

29 What is the sum $\angle A + \angle B + \angle C + \angle D + \angle E$?

A 150°
B 180°
C 360°
D 540°
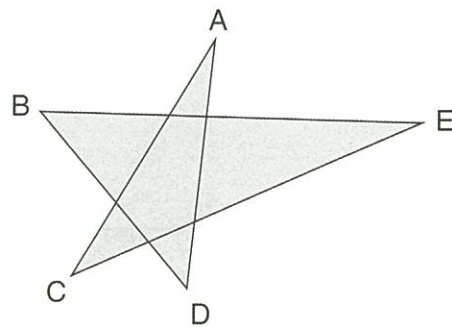
16 A ball is placed inside a cubical box such that it touches all the faces of the box.

The side length of the box is 21 cm.

Which calculation gives the volume of the space **not** occupied by the ball?

A $21^2 - \pi (10.5^2)$

B $21^3 - \dfrac{4}{3}\pi (10.5^3)$

C $21^3 - \pi (10.5^3)$

D $6 \times 21^2 - 4\pi (10.5^2)$
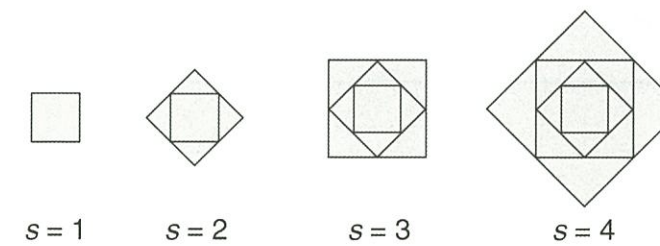

21 cm
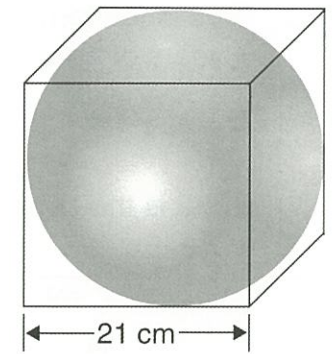
17 A mother's age is x years.

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**

18 Squares are added and rotated to form a pattern.
When squares are added, triangles are formed.

$s = 1$ $s = 2$ $s = 3$ $s = 4$

Which rule relates the number of triangles (t) to the number of squares (s) in the shapes?

$t = 4$	$t = 4s$	$t = s^2$	$t = 4s - 4$
A	**B**	**C**	**D**

19 This is the formula to calculate the dose (*D*) in ml of a particular medicine for a child *x* years of age.
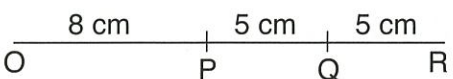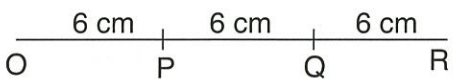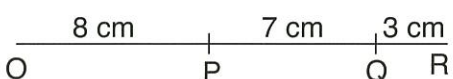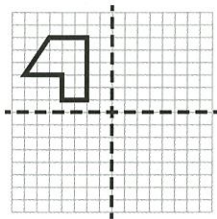
$$D = \frac{60x}{x + 10}$$

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**

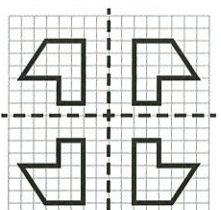**20** Four wires are bent at points P and Q so that OP, PQ and QR form the sides of a triangle.
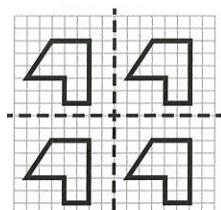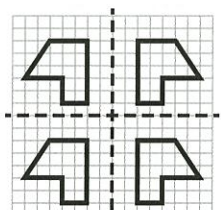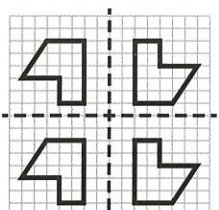
Which wire will **not** form a triangle?

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

21

Which option shows the shape after it is reflected in the dashed lines?

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

22 Which integer is closest to $\sqrt{63}$?

7	8	32	3969
A	**B**	**C**	**D**

23 Sam is *x* years old now.
Lin is 3 years younger than Sam.
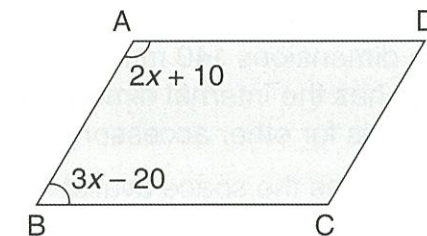In five years' time, Lin will be four-fifths Sam's age.

Which equation describes their ages in five years' time?

A $x + 5 = \frac{4}{3}(x - 3)$

B $x - 3 = \frac{4}{5}(x + 5)$

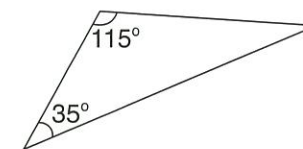**C** $\frac{4}{5}x = (x + 2)$

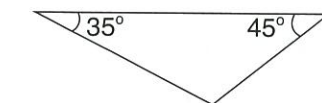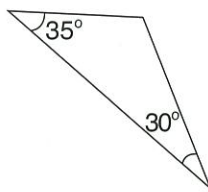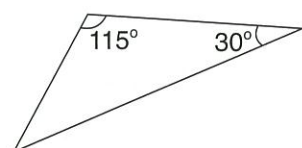**D** $x + 2 = \frac{4}{5}(x + 5)$

24 ABCD is a parallelogram.

What is the value of *x*?

A 20
B 30
C 34
D 38

25 Which triangle is **not** similar to the triangle below?

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