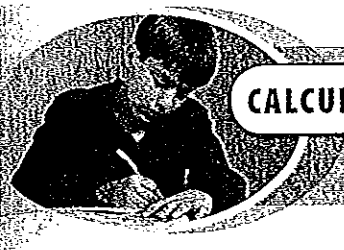


CALCULATOR ALLOWED | Advanced level questions

Mini Test 32: Mixed Questions

20 MIN

1 Tamsin received 25 emails yesterday. Today she received 40. What percentage increase is this?

A 38% B 40% C 60% D 63%

2 The ratio of apples to pears in a fruit bin was 8 to 3. There were 192 apples. How many pears were in the bin? ☐

3 What number is exactly halfway between 37.2 and 50.6? ☐

4 A polygon has two right angles. Each of its other angles measures 135°. What type of polygon is it?

A pentagon B hexagon
C octagon D decagon

5 Simon left home at 8:40 am and drove until 11:10 am at an average speed of 72 kilometres per hour. If his car uses 8 litres for every 100 km travelled, how much petrol would Simon have used on this trip? ☐ litres

6 1 gigalitre is 1 000 000 000 litres.

A lake holds 3.9 gigalitres of water. How many kilolitres is this?

A 3 900 000 B 390 000 000
C 39 000 000 D 39 000

7 Jake drew up this table showing the relationship between pairs of numbers.

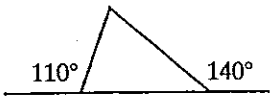
First number	1	2	3	4	5
Second number		8	27	64	125

When the first number is 1, what should the second number be?

A 1 B 3 C 5 D 7

8 The triangle in this diagram is

A acute-angled, scalene.
B acute-angled, isosceles.
C obtuse-angled, scalene.
D obtuse-angled, isosceles.



9 A rule to calculate the distance to the horizon (in kilometres) when the height above sea level (in metres) is known is:

Distance = 5 × square root of (height ÷ 2).

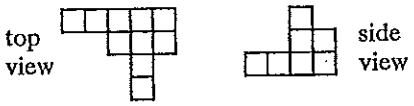
Use this rule to find the distance to the horizon from a point 32 metres above sea-level. ☐ km

10 The value of $\frac{\sqrt{15625}}{5+20}$ is

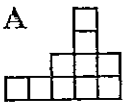
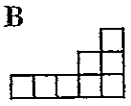
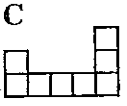
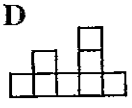
A 45 B 1 C 11.25 D 5

11 The average (mean) age of five children is 8. Their father is 32. What is the average age of the children and their father? ☐

12 Veronica made a shape using identical cubes joined together. She then drew a top view and a side view.



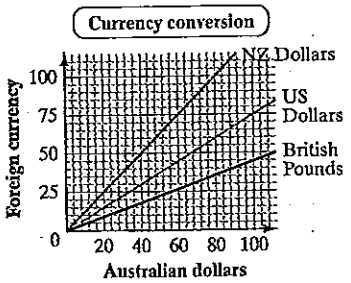
Which could **not** be a front view?

A  B  C  D 

13 These two rectangles have the same area.

What is the length of the second rectangle? ☐ m

14 This graph is used to convert amounts in Australian dollars to other currencies. What is the approximate value in New Zealand dollars of 35 British pounds?



A NZ$35 B NZ$45 C NZ$80 D NZ$100

Answers and explanations on pages 131–132

Mini Test 32: Mixed Questions Page 35

1 C **2** 72 **3** 43.9 **4** B **5** 14.4 L **6** A **7** A
8 B **9** 20 km **10** D **11** 12 **12** A **13** 45 m **14** D

1 Increase = 40 − 25
= 15
Percentage increase = $\frac{15}{25} \times 100\%$
= 60%

2 For every 3 pears there are 8 apples.
Now 192 ÷ 8 = 24
So there are 24 lots of 8 apples.
There will also be 24 lots of 3 pears.
Number of pears = 24 × 3
= 72

3 The number halfway between two others is the average of those other numbers.
Now 37.2 + 50.6 = 87.8
87.8 ÷ 2 = 43.9
So the number halfway between 37.2 and 50.6 is 43.9.

4 Consider the options.
A pentagon has 5 angles.
Angle sum = (5 − 2) × 180°
= 3 × 180°
= 540°
If the polygon is a pentagon there will be 2 angles of 90° and 3 of 135°.
2 × 90° + 3 × 135° = 180° + 405°
= 585°
So the polygon is not a pentagon because the angles do not add to 540°.

A hexagon has 6 angles.
Angle sum = (6 − 2) × 180°
= 4 × 180°
= 720°
If the polygon is a hexagon there will be 2 angles of 90° and 4 of 135°.
2 × 90° + 4 × 135° = 180° + 540°
= 720°
So the polygon is a hexagon because the angles do add to 720°.

5 From 8:40 until 10:40 is 2 hours.
From 10:40 until 11:10 is 30 minutes or half an hour.
So Simon travelled for $2\frac{1}{2}$ hours.
Distance travelled = $2\frac{1}{2} \times 72$ km
= 180 km
Now 180 ÷ 100 = 1.8
So Simon travelled for 1.8 lots of 100 km.
Amount of petrol used = 1.8 × 8 L
= 14.4 L

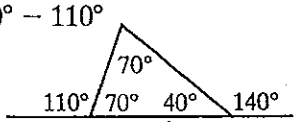
6 1 kilolitre = 1000 litres
3.9 gigalitres = 3900000000 litres
= 3900000 × 1000 litres
= 3900000 kilolitres

7 [Study the pairs of numbers in the table to find the rule connecting them.]

First number	1	2	3	4	5
Second number		8	27	64	125

The rule is that the second number is the first number cubed.
[8 = 2 × 2 × 2; 27 = 3 × 3 × 3 etc]
So when the first number is 1,
the second number = 1 × 1 × 1
= 1

8 Angles in a straight line add to 180°.
So the angle that forms a straight line with the angle of 110° is 70°.
The angle that forms a straight line with the angle of 140° is 40°.
Angles of a triangle add to 180°.
Now 70° + 40° = 110°
Remaining angle = 180° − 110°
= 70°



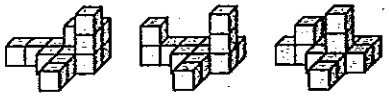
All the angles of the triangle are acute, so it is an acute-angled triangle.
Two of the angles are equal so the triangle is isosceles.
The triangle is acute-angled and isosceles.

9 Distance = 5 × square root of (height ÷ 2)
= 5 × square root of (32 ÷ 2)
= 5 × square root of 16
= 5 × 4
= 20
The distance to the horizon would be 20 km.

10 $\frac{\sqrt{15625}}{5+20} = \frac{125}{25}$
= 5

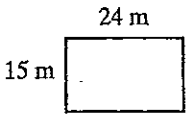
11 The average age of 5 children is 8.
Sum of their ages = 8 × 5
= 40
Total of ages of the children and their father
= 40 + 32
= 72
Average age = 72 ÷ 6
= 12

12 From the side view of the object you can see that it is at most 3 cubes high. The front view showing the object to be 4 cubes high cannot be correct.
The front view cannot be A.
The other views could be given by:



13 Area = length × width

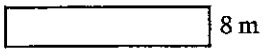
First rectangle:



Area = 24 m × 15 m
= 360 m^2

So the area of the second rectangle is 360 m^2.

Second rectangle:



360 m^2 = length × 8 m
length = (360 ÷ 8) m
= 45 m

[Or, the width of the second rectangle is one-third of the length of the first rectangle so, because the areas of the rectangles are the same, the length of the second rectangle must be three times the width of the first rectangle. 3 × 15 = 45]

14 35 British pounds is about $80 Australian, which is about $100 New Zealand.