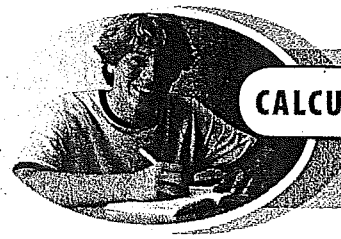


CALCULATOR ALLOWED | **Advanced level questions** | 25 MIN

Mini Test 32: Mixed Questions

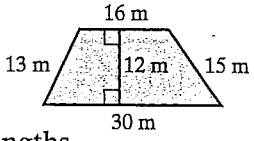
1 Jeremy completes a marathon in 3 hours and 9 minutes. The length of the marathon is 42 km. On average, how many minutes did Jeremy take to run each kilometre? ☐ minutes

2 In a survey, 64 people were asked how many cars were usually garaged at their address. The results are shown in the sector graph. How many people had two cars garaged at their address? ☐

3 If 9 is the mean of 3, 15, 7 and x then x must be

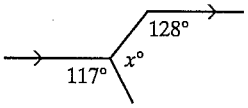
A 2 **B** 9 **C** 11 **D** 12

4 The formula for finding the area of a trapezium is $A = \frac{h}{2}(a + b)$ where a and b are the lengths of the parallel sides and h is the perpendicular height between them. What is the area of this trapezium? ☐ m^2

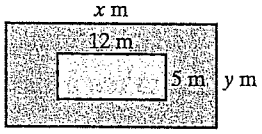


5 What is the value of x?

A 52 **B** 65 **C** 115 **D** 128



6 This is a plan of a yard.



Key: ☐ paving ☐ pool

The area of the paving, in square metres, is

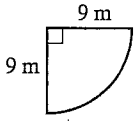
A $12x - 5y$ **B** $12y - 5x$ **C** $2xy - 60$ **D** $xy - 60$

7 What is the value of $2n^2 - 5n + 3$ when $n = -3$?

A 54 **B** 36 **C** 6 **D** 0

8 A school has just two classes in Year 7. There are 28 students in 7C and 22 students in 7H. The ratio of boys to girls is 3 to 4 in 7C and 5 to 6 in 7H. What percentage of the school's Year 7 students are boys? ☐ %

9 A garden bed is in the shape of a quarter circle. Jason wants to put a concrete mowing strip around the whole garden. The length of this strip is closest to

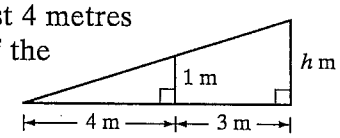


A 32 m **B** 64 m **C** 25 m **D** 46 m

10 $5(3x + 1) - 7x + \square = 8x + 9$

What must be placed in the box so that this equation is true for all values of x? ☐

11 A ramp has been built with a 1-metre high support post 4 metres from the base of the ramp as shown in the diagram.



How high is the ramp at its highest point? ☐ m

12 What is the highest prime factor of 1750? ☐

13 A pentagonal pyramid and a pentagonal prism have identical bases. Those faces are stuck together to form one solid. How many more edges than faces does the new object have?

A 5 **B** 7 **C** 9 **D** 11

14 This spinner is spun twice and the numbers are added together to get the result. There are 9 different possible outcomes. What is the probability that the result is 4?

A $\frac{1}{3}$ **B** $\frac{1}{4}$ **C** $\frac{1}{9}$ **D** $\frac{4}{9}$

15 What is the next number in this pattern?

$\frac{1}{15}, \frac{3}{5}, 1\frac{2}{15}, 1\frac{2}{3}$

A $1\frac{13}{15}$ **B** $2\frac{4}{15}$ **C** $2\frac{1}{3}$ **D** $2\frac{1}{5}$

16 For the first five games of the netball season, the Wrens' average (mean) number of goals scored per game was 52. For the remaining ten games, the Wrens' average had increased to 67. What was the average number of goals per game for the season?

A 63.5 **B** 62 **C** 61 **D** 59.5

Answers and explanations on pages 136–137

Mini Test 32: Mixed Questions

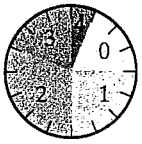
Page 35

1 4.5 min **2** 20 **3** C **4** 276 m^2 **5** C **6** D **7** B
8 44% **9** A **10** 4 **11** 1.75 m **12** 7 **13** C
14 A **15** D **16** B

1 Distance = 42 km
Time = 3 h 9 min
= (3 × 60 + 9) min
= 189 min

Time per kilometre = (189 ÷ 42) min
$= 4\frac{1}{2}$ min

2 The sector graph is broken up into 16 parts.



Now 64 ÷ 16 = 4
So each part represents 4 people.
The sector for 2 cars is 5 parts.

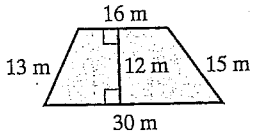
Number of people = 5 × 4
= 20

3 The mean of 4 numbers is 9.
Sum of the numbers = 4 × 9
= 36

Now 3 + 15 + 7 = 25
So x = 36 − 25
= 11

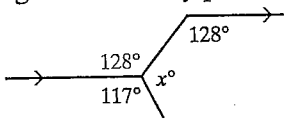
4 $a = 16$, $b = 30$ and $h = 12$

$A = \frac{h}{2}(a + b)$
$= \frac{12}{2}(16 + 30)$
= 6 × 46
= 276



The area of the trapezium is 276 m^2.

5 Alternate angles formed by parallel lines are equal.

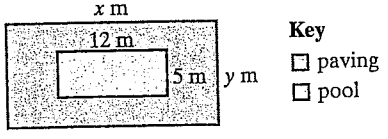


Angles at a point add to 360°.
So x + 117 + 128 = 360
x + 245 = 360
x = 360 − 245
= 115

6 The area of the outer rectangle = x m × y m
= xy m^2

The area of the inner rectangle = 12 m × 5 m
= 60 m^2

So the paved area = (xy − 60) m^2



7 When n = −3,
$2n^2 - 5n + 3 = 2 \times (-3)^2 - 5 \times (-3) + 3$
= 2 × 9 + 15 + 3
= 18 + 15 + 3
= 36

8 Of the 28 students in 7C, there are 3 boys for every 4 girls.
So 3 out of 7 students are boys.

Number of boys in 7C = $\frac{3}{7}$ of 28
= 12

Of the 22 students in 7H, there are 5 boys for every 6 girls.
So 5 out of 11 students are boys.

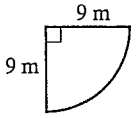
Number of boys in 7H = $\frac{5}{11}$ of 22
= 10

Total boys in Year 7 = 12 + 10
= 22

Total students in Year 7 = 28 + 22
= 50

Percentage of boys = $\frac{22}{50} \times 100\%$
= 44%

9 The radius is 9 metres.
The diameter is 18 metres.



Length of arc = $\frac{1}{4} \times \pi \times 18$ m
= 14.137... m

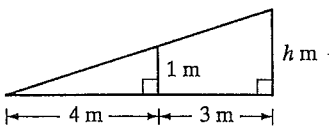
Length of concrete strip
= (14.137... + 9 + 9) m
= 32.137... m

Of the options, the closest to the length of the strip is 32 metres.

10 $5(3x + 1) - 7x + \square = 8x + 9$
Now $5(3x + 1) - 7x = 15x + 5 - 7x$
$= 8x + 5$
$8x + 5 + 4 = 8x + 9$
So the missing term is 4.

11 [The two triangles are similar so the sides are in proportion.]

$\frac{h}{7} = \frac{1}{4}$
$h = \frac{1}{4} \times 7$
$= 1\frac{3}{4}$
= 1.75

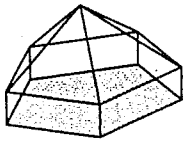


The ramp is 1.75 metres high at its highest point.

12 1750 = 10 × 175
Now 10 = 2 × 5 and 175 = 5 × 35
So 1750 = 2 × 5 × 5 × 35
= 2 × 5 × 5 × 5 × 7

The highest prime factor of 1750 is 7.

13 The new shape has 11 faces.



It has 20 edges.

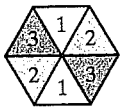
Difference $= 20 - 11$

$= 9$

The new object has 9 more edges than faces.

14 There are 9 possible outcomes, each of which is equally likely to occur.

[1 + 1, 1 + 2, 1 + 3, 2 + 1, 2 + 2, 2 + 3, 3 + 1, 3 + 2, 3 + 3]



The ways to get a result of 4 are 1 + 3, 2 + 2 and 3 + 1.

There are 3 ways to get a result of 4.

Probability of $4 = \frac{3}{9}$

$= \frac{1}{3}$

15 $\frac{1}{15}, \frac{3}{5}, 1\frac{2}{15}, 1\frac{2}{3}$

$\frac{3}{5} - \frac{1}{15} = \frac{8}{15}$

$1\frac{2}{15} - \frac{3}{5} = \frac{8}{15}$

$1\frac{2}{3} - 1\frac{2}{15} = \frac{8}{15}$

So the numbers are increasing by $\frac{8}{15}$ each time.

The next number $= 1\frac{2}{3} + \frac{8}{15}$

$= 2\frac{1}{5}$

16 Total goals scored in first 5 games $= 5 \times 52$

$= 260$

Total goals scored in last 10 games $= 10 \times 67$

$= 670$

Total goals scored in the season $= 260 + 670$

$= 930$

Total games $= 5 + 10$

$= 15$

Goals per game $= 930 \div 15$

$= 62$