# Warwick School

11+ Entrance Examination

Mathematics

Please write your full name here:

_____

Before you start read these instructions:

➤ This test lasts 45 minutes

➤ We would like to see how you worked out your answers, so show your working. We may be able to give you marks even if the answer is wrong.

➤ If you get stuck, do not worry. Do not spend lots of time on it, just go on to the next question. You may have time at the end to try the question again.

➤ Do **not** use a calculator.

Remember to show your working

1. Work out:

a) $5982 + 362$

$$\begin{array}{r} \overset{1}{5}\overset{1}{9}82 \\ +\ 362 \\ \hline 6344 \end{array}$$

Answer: __6344__ [1]

b) $1352 - 478$

$$\begin{array}{r} \overset{12}{1}\overset{4}{3}\overset{1}{5}2 \\ -\ 478 \\ \hline 874 \end{array}$$

Answer: __874__ [1]

c) 342×6

$$\begin{array}{r} 342 \\ \times\ 6 \\ \hline 2\overset{2}{0}\overset{1}{5}2 \end{array}$$

Answer: __2052__ [1]

d) $1404 \div 6$

$$6\overline{)1\,4\,{}^{2}0\,{}^{2}4} = 0234$$

Answer: __234__ [1]

2. Calculate

a) $\dfrac{3}{4} + \dfrac{2}{5}$

$$\frac{15+8}{20} = \frac{23}{20} = 1\frac{3}{20}$$

Answer: $1\frac{3}{20}$ [3]

b) $\dfrac{3}{5} \times \dfrac{4}{7}$

$$= \frac{3\times4}{5\times7} = \frac{12}{35}$$

Answer: $\frac{12}{35}$ [3]

3. Find the next two numbers in these sequences:
   a) 2, 8, 14, 20, 26, 32 , 38

      $+6$ $+6$ $+6$ $+6$ $+6$ $+6$

   b) 1, 3, 9, 27, 81, 243 , 729

      $\times 3$ $\times 3$ $\times 3$ $\times 3$

      $\begin{array}{r} 81 \\ \times\ 3 \\ \hline 243 \end{array}$
      $\begin{array}{r} 243 \\ \times\ \ 3 \\ \hline 729 \end{array}$

   c) 1, 2, 4, 7, 11, 16 , 22

      $+1$ $+2$ $+3$ $+4$ $+5$ $+6$

   [3]

4. 81 Warwick School boys and 6 teachers need to be transported to another school for rugby matches. The school hires a 53-seat coach. Everyone else will be transported using the school's 15-seat minibuses. (The seating capacity excludes the driver's seat in each case.) The coach company supplies a driver, but the minibuses will be driven by the teachers.

   a) How many of the people travelling do not fit on the coach?

      $\begin{array}{r} 81 \\ +\ 6 \\ \hline 87 \end{array}$
      $\begin{array}{r} 87 \\ -53 \\ \hline 34 \end{array}$

      Answer: ___34___ [2]

   b) How many minibuses are needed?

      Minibus ① 15 + 1 = 16
      ② 15 + 1 = 16
      ③ 1 + 1 = $\frac{}{32}$

      Answer: ___3___ [1]

   c) How many spare seats are there in total?

      Answer: ___14___ [1]

5. Work out 7×16−14×4

   $\begin{array}{r} 16 \\ \times\ 7 \\ \hline 112 \end{array}$
   $\begin{array}{r} 14 \\ \times\ 4 \\ \hline 56 \end{array}$
   $\begin{array}{r} 112 \\ -\ 56 \\ \hline 56 \end{array}$

   Answer: ___56.___ [2]

6. There are 90 000 people at Wembley stadium watching an England football match, and $\frac{5}{6}$ of these are home fans. How many people present are home fans?

$\frac{5}{6} = 6\overline{)90,000} \quad \begin{array}{r} 15,000 \\ \hline \end{array}$

$\begin{array}{r} 15 \\ \times\ 5 \\ \hline 75 \end{array}$

$15,000 \times 5$

Answer: __75,000__ [2]

7. How many centimetres are there in 5.9 metres?

$5.9 \times 100 = 590$

Answer: __590__ cm [1]

8. a) Write down a prime number between 12 and 20.

13, 17, 19

Answer: __X__ [1]

   b) Write down a number between 12 and 20 that is the product of two prime numbers.

2, 3, 5, ⑦, 11, 13

$2 \times 7 = 14$

Answer: __14__ [2]

9. Two friends go to a bookshop where there is a special offer that all books cost the same amount. One friend buys 5 books at a cost of £34.95. The other buys 3 books: what is the cost of these?

$\begin{array}{r} 0\ 6.99 \\ 5\overline{)3^{3}4.^{4}9^{4}5} \end{array}$

$\begin{array}{r} 6.99 \\ \times\ 3 \\ \hline 20.97 \end{array}$

or £7 × 3 − 3p.

Answer: __£20.97__ [3]

10. A room is 6280 millimetres long. What is this in metres?

$6280 \div 1000$

Answer: __6.28__ m [1]

11. Last night the temperature was −8°C but today it is 5°C. By how much has the temperature gone up?

$-8 < 8 \times 0 \times 5 > 5$

Answer: **13** °C [1]

12. Convert these to decimals:

a) 73% ÷100

0.73

Answer: **0.73** [1]

b) 7% ÷100

0.07

Answer: **0.07** [1]

c) $\frac{4}{5}$

$\begin{array}{r} 0.8 \\ 5\overline{)4.^40} \end{array}$

Answer: **0.8** [2]

13. Ian goes on a deep sea fishing trip whilst on holiday. It costs him £15 to go on the boat, and then he needs to pay £2 to keep each fish he catches. If he keeps n of the fish he catches, write down a formula for his total cost £C of his fishing trip.

$\text{Cost} = \text{Boat trip} + £2 \times \text{fish Caught}$

$C = £15 + £2 \times n$

Answer: $C = 15 + 2n$ [3]

14. A train leaves Birmingham New Street station at 13:49 and arrives at London Euston at 15:13. How long did the journey take?

1349   1400   1500   1513
|—11min—×|—1 hour—×|—13 min—×|

1 hr 24 min

Answer: **1** hours **24** minutes [2]

15. A particular fruit drink is made by mixing apple juice and orange juice in the ratio 7:5. How much apple juice is needed to make 36 litres of the fruit drink?

A : O = Drink
7 : 5 = 12 (×3)
(×3) 21 : 15   36 l

Answer: __21 litre__ [3]

16. I think of a number, add 5 and then divide by 3 and the result is 6. What was the number I thought of?

x

□ → +5 → ÷3 → 6

or

$\dfrac{x+5}{3} = 6$

13 → −5 ← ×3 ← 6
       18

$x + 5 = 18$

$x = 13$

Answer: __13__ [2]

17. The pie chart shows the favourite sports of 40 boys at Warwick School.
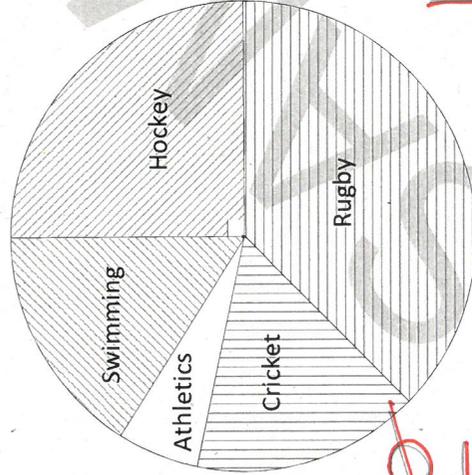
a) How many boys said hockey was their favourite sport?

$\frac{1}{4}$ of 40

Answer: __10__ [1]

b) The angle in the rugby sector is 135°. How many boys said rugby was their favourite sport?

$\dfrac{135}{360}$

$\dfrac{135 \times 40}{360}$

$\dfrac{135}{9}$

    15
9)135

Answer: __15__ [2]

18. Work out 523 × 47

    5 2 3
  ×   4 7
  ----
  3 6 6 1
  2 0 9 2 0
  ----
  2 4 5 8 1

Answer: __24581__ [2]

Remember to show your working

19. Work out $4352 \div 17$

$$17 \overline{\smash{)}4352}$$

Working:
```
      0 2 5 6
17 ) 4 3 5 2
       34
       51
       68
       85
      102
```

Answer: __256__ [2]

## 20.
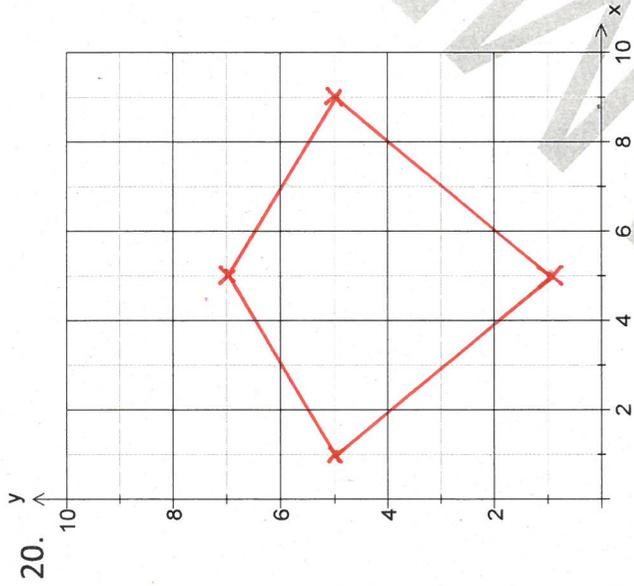
a) Plot the points (5,1), (9,5), (5,7) and (1,5) and join them up to make a shape. [2]

b) What name is given to this shape?

Answer: __kite__ [1]

21. Work out the area of these triangles.

4 cm, 6 cm (right-angled triangle)

$$\frac{4 \times 6}{2} = 12$$

Answer: __12__ cm² [2]

4 cm, 8 cm

$$\frac{4 \times 8}{2} = 16$$
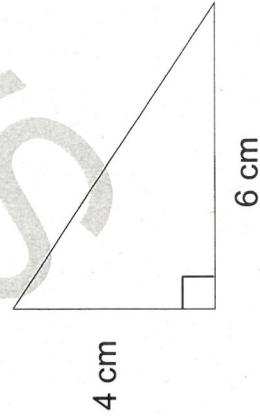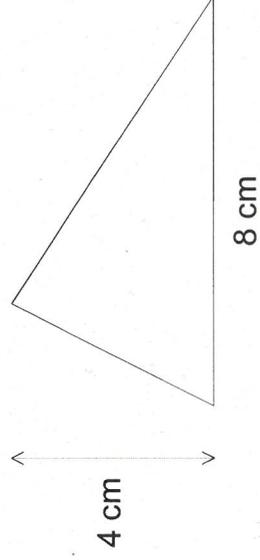
Answer: __16__ cm² [2]

Remember to show your working

22. Find the perimeter and area of this shape.

$7+2+3+2+3+3+7+7$

7 cm
2 cm
2 cm
3 cm
3 cm
7 cm

7×2
2×4
3×7
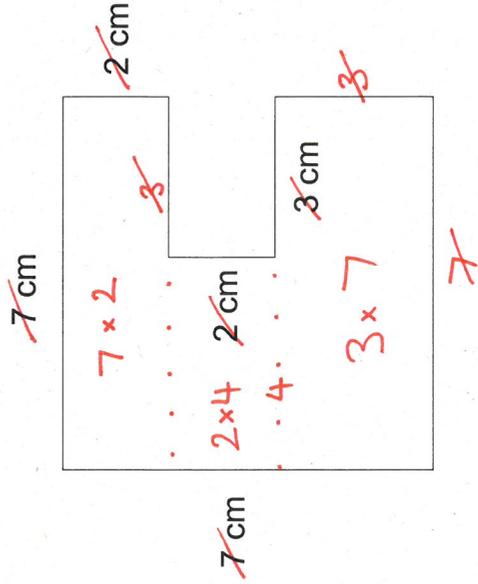
Perimeter = __34__ cm [2]

$7 \times 2 = 14$
$2 \times 4 = 8$
$3 \times 7 = 21$
43

Area = __43__ cm² [3]

23. The diagram shows six shapes labelled A to F.
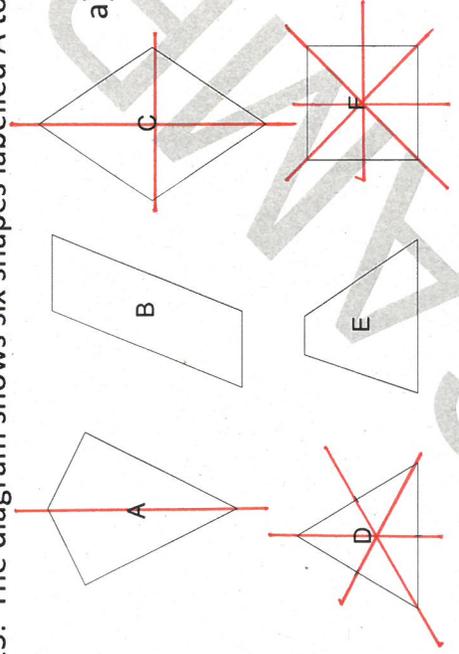
a) Which shape has one line of symmetry and no rotational symmetry?

Answer: __A__ [1]

b) Which shape has two lines of symmetry and rotational symmetry order 2?

Answer: __C__ [1]

c) Which shape has no line symmetry and rotational symmetry order 2?

Answer: __B__ [1]

d) Which shape has rotational symmetry of order 4?

Answer: __F__ [1]

24. a) List the factors of 15.

Answer: $\underline{1, 15, 3, 5}$ [2]

1, 3, 5, 15

b) List the multiples of 4 that are less than 15.

Answer: $\underline{4, 8, 12}$ [2]

4, 8, 12,

25. Calculate 60% of £180.

Answer: $\underline{108}$ [2]

10% = 18
× 6
108

26. Find x.

63
+ 76
139

180
− 139
041
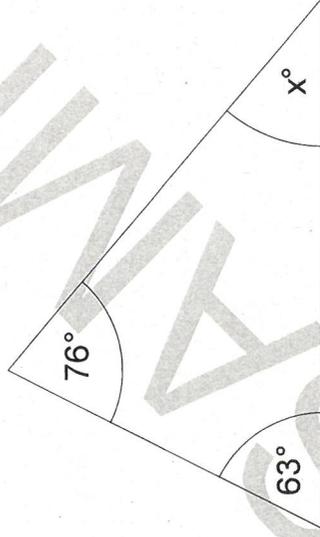
Answer: x = $\underline{41}$ [2]

27. This triangle is isosceles. Find y.
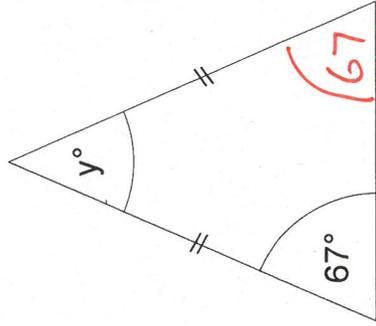
67
67
134

180
− 134
46

Answer: y = $\underline{46}$ [3]

28. Here are the numbers of children in ten families:

    3, 2, 1, 5, 2, 4, 2, 1, 4, 3.

    a) What is the mean (average) number of children per family?

    $27 \div 10$

    Answer: __2.7__ [2]

   b) What is the mode of the children per family?

    3 - 2 of
    2 - 3 of ←
    1 - 2 of
    5 - 1
    4 - 2

    Answer: __2__ [1]

    c) What is the median number of children per family?

    1, 2, 2, 2, ③, 3, 4, 4, 5

    Answer: __3__ [2]

29.

Input → Multiply by 3 (÷3) → Subtract 2 (+2) → Output

4 · 12 · 36 · 10 · 34
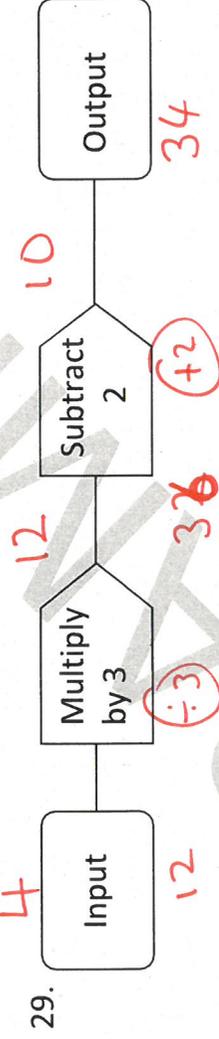
a) If the input is 4, what is the output?

Answer: __10__ [1]

b) If the output is 34, what is the input?

Answer: __12__ [2]

c) If the input is x, what is the output?

$x \times 3 \quad -2$

$= 3x - 2$

Answer: __$3x - 2$__ [2]

Remember to show your working
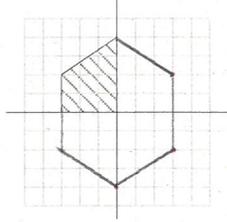
a) Reflect the shaded shape in the horizontal line, and then reflect both the shape and its image in the vertical line. [1]

b) Name the overall shape that you have created. [1]

hexagon .

30.

31. Triangle ABC has area 150 cm^2. The angle at B is 90°. Side AC has length 25cm, and AB has length 15cm.

A

15 cm

D

25 cm

B

C

$$\text{Area } \triangle = \frac{1}{2} \times B \times h$$
$$= \frac{B \times h}{2}$$

a) What is the length of side BC?

$$\frac{15 \times BC}{2} = 150$$
$$BC = \frac{150 \times 2}{15} = \frac{300}{15}$$

Answer: **20cm** [2]
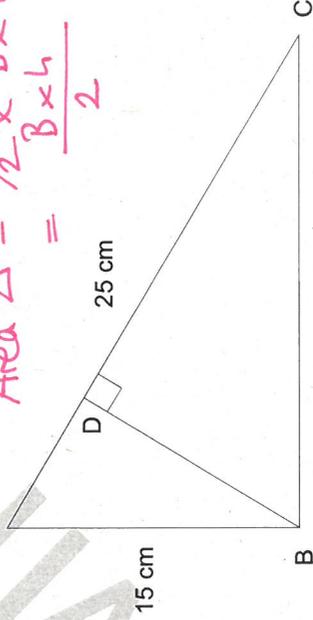
b) What is the length of the line BD?

$$\frac{BD \times 25}{2} = 150$$
$$BD = \frac{150 \times 2}{25} = \frac{300}{25}$$

Answer: **12 cm** [2]

$$1 \qquad \frac{1}{2} \qquad \frac{2}{3} \qquad \frac{3}{5} \qquad \frac{5}{8} \qquad \frac{8}{13}$$

Remember to show your working

32. The first number in a sequence is 1. To get from one number to the next, add on one, then divide 1 by the answer.

$1+1=2$ and $1\div 2 = \frac{1}{2}$, so the second number is $\frac{1}{2}$.

$\frac{1}{2}+1=\frac{3}{2}$ and $1\div\frac{3}{2}=\frac{2}{3}$, so the third number is $\frac{2}{3}$.

a) What is the fourth number in the sequence?

Answer: $\frac{3}{5}$ [1]

b) What is the fifth number in the sequence?

Answer: $\frac{5}{8}$ [1]

c) One number in this sequence is $\frac{13}{21}$; what is the previous number?

Answer: $\frac{8}{13}$ [2]

d) If n is a number in this sequence, what is the next number?

Answer: $\frac{1}{n+1}$ [2]

END OF EXAMINATION

Now go back, check your answers and try any questions you may have left out.