LEVEL 5

Level 5

N13 N14 N15 N16 N17 N18 C14 C15 C16 C17 C18 C19 C20 C21
A3   A4   A5   A6   S13 S14 S15 S16 D6   D7

1) 3.6×10 = _____

2) 82.9×100 = _____

3) 0.5×1000 = _____

4) $47 \div 10$ = _____

5) $106.4 \div 10$ = _____

6) $9.9 \div 100$ = _____

7) 6.2×1000 = _____

8) $70 \div 1000$ = _____

9) 0.035×10000 = _____

10) $0.01 \div 100$ = _____

Level 5

| N13 | N14 | N15 | N16 | N17 | N18 | C14 | C15 | C16 | C17 | C18 | C19 | C20 | C21 |
| A3 | A4 | A5 | A6 | S13 | S14 | S15 | S16 | D6 | D7 |

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1) Fill in the missing box in each case.

a) $12 \longrightarrow \times 100 \longrightarrow \boxed{}$ f) $540 \longrightarrow \boxed{} \longrightarrow 5.4$

b) $7.5 \longrightarrow \div 10 \longrightarrow \boxed{}$ g) $0.6 \longrightarrow \boxed{} \longrightarrow 0.006$

c) $83.1 \longrightarrow \boxed{} \longrightarrow 8310$ h) $\boxed{} \longrightarrow \div 100 \longrightarrow 73.7$

d) $0.9 \longrightarrow \boxed{} \longrightarrow 900$ i) $\boxed{} \longrightarrow \times 10 \longrightarrow 0.18$

e) $662 \longrightarrow \boxed{} \longrightarrow 66.2$ j) $\boxed{} \longrightarrow \times 1000 \longrightarrow 104$

2) Using the fact below:

$$365 \times 17 = 6205$$

Work out the following

a) $36.5 \times 17 = $ _____   d) $3650 \times 1.7 = $ _____

b) $36.5 \times 1.7 = $ _____   e) $62.05 \div 17 = $ _____

c) $365 \times 170 = $ _____   f) $6.205 \div 36.5 = $ _____

Level 5

N14 Rounding

1) Using a calculator, work out the following.
   Give your answers to the nearest 10.

   a) 24 × 14

   b) 383 × 43

   c) 4088 ÷ 56

   d) 265364 ÷ 326

   e) (42000 + 768) ÷ 54

2) Round the following numbers to 1 decimal place.

   a) 4.21   f) 578.48

   b) 53.43   g) 79.035

   c) 31.59   h) 3443.77052

   d) 8.827   i) 26.9999

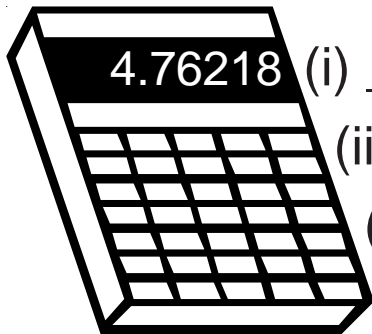   e) 0.653   j) 99.961

Level 5

N14   Just For Fun
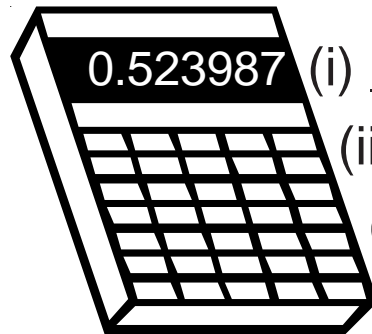
Round each of the numbers on the calculators to
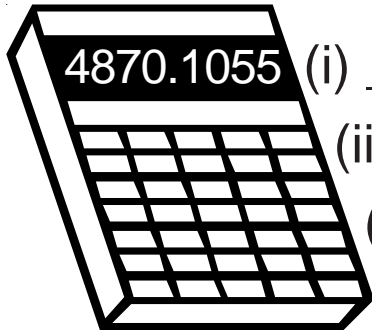(i)   1 d.p.
(ii)   2 d.p.
(iii)   the nearest whole number.

1)   4.76218   (i) ____
(ii) ____
(iii) ____
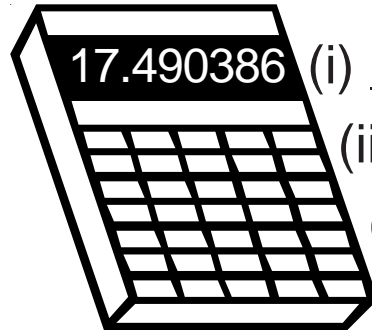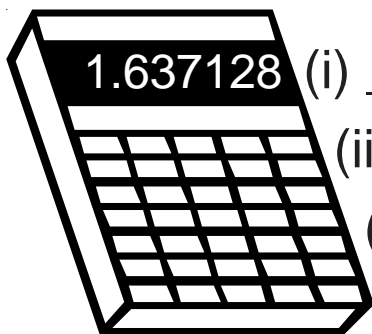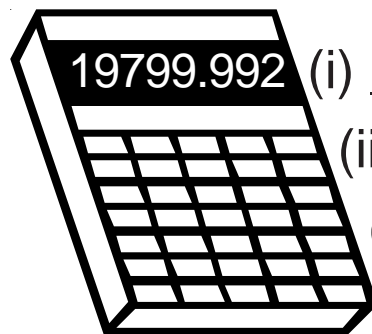
2)   0.523987   (i) ____
(ii) ____
(iii) ____

3)   4870.1055   (i) ____
(ii) ____
(iii) ____

4)   17.490386   (i) ____
(ii) ____
(iii) ____

5)   1.637128   (i) ____
(ii) ____
(iii) ____

6)   19799.992   (i) ____
(ii) ____
(iii) ____

N15 Ordering Negative Numbers

1) Work out the value of each card and then place the cards in order from lowest to highest.

A

The temperature is -2 °C and then rises by 6.5 °C.

B

1 °C colder than freezing point.

C

The temperature is -6 °C then rises by 8 °C before falling by 5 °C.

D

102 °C cooler than boiling point.

2) Work out the value of each card and then place the cards in order from lowest to highest.

E

You have £5 in the bank but write a cheque for £9.

F

Tim owes you £5.
Sam owes you £3.
You owe Ben £12.
Tom owes you £2.

G

You have £10 in the bank but then write cheques for £6, £2.50, £5 and £1.

H

You owe three people £0.50 each.

I

You owe five people £1.25 each but someone owes you £3.50

J

You owe seven people £2 each but six people each owe you £1.50

Level 5

1)

5 **2**
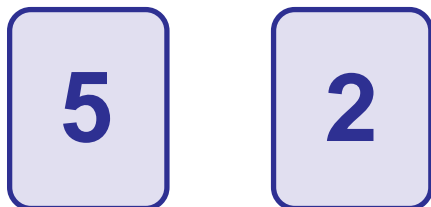
These two cards each have a number on the back as well as on the front.

Eric shuffles the cards quite a few times and lays them on the table.

He then adds the numbers he can see.

He discovers there are four different totals.

They are: 3, 5, 7 and 9.

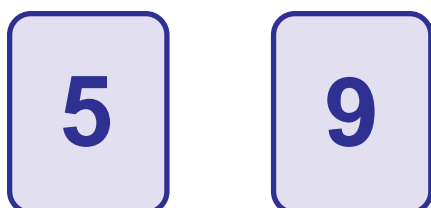*Can you work out what numbers are on the back of each card?*

2)

12 **8**

The totals with these cards are:

11, 13, 20 and 22.

Can you work out what numbers are on the back of each card?

3)

5 **9**

The totals with these cards are:

2, 7, 9 and 14.

Can you work out what numbers are on the back of each card?

4)

12 **7**

The totals with these cards are:

2, 3, 19 and 20.

Can you work out what numbers are on the back of each card?

Level 5

N16 Ordering Fractions

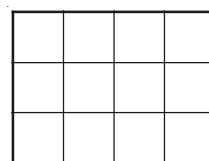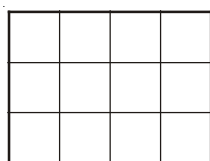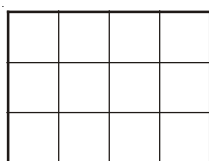1) Put the following fractions in order of size starting with the smallest.

   You can use the grids to help if you wish.

   $$\frac{3}{4} \qquad \frac{5}{6} \qquad \frac{2}{3} \qquad \frac{7}{12}$$

2) Put the following fractions in order of size starting with the smallest.

   You can use the grids to help if you wish.

   $$\frac{13}{20} \qquad \frac{3}{5} \qquad \frac{3}{4} \qquad \frac{7}{10}$$
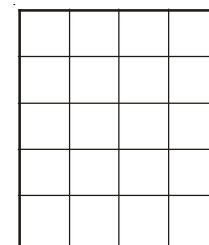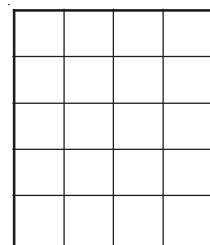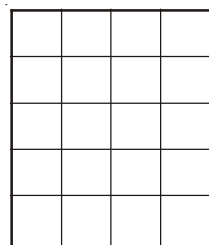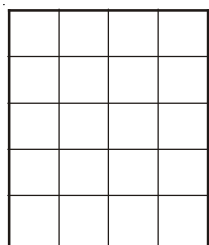
3) Put the following fractions in order of size starting with the smallest.

   $$\frac{7}{12} \qquad \frac{1}{2} \qquad \frac{5}{8} \qquad \frac{13}{24}$$

4) Put the following fractions in order of size starting with the smallest.
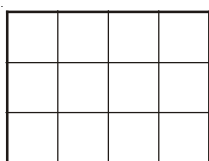
   $$\frac{2}{5} \qquad \frac{3}{10} \qquad \frac{1}{3} \qquad \frac{1}{6}$$

Level 5

Place the fractions on the cards in order of size from smallest to largest.

$$\frac{17}{30}$$

$$\frac{2}{5}$$

$$\frac{2}{3}$$

Smallest ____

____

____

$$\frac{1}{2}$$

$$\frac{9}{20}$$

$$\frac{47}{60}$$

____

____

$$\frac{1}{3}$$

____

$$\frac{7}{15}$$

$$\frac{15}{24}$$

____

____

$$\frac{3}{4}$$

____

$$\frac{3}{8}$$

$$\frac{7}{12}$$

____

Largest ____

Level 5

1) Cancel each of these fractions to their simplest form:

   a) $\dfrac{2}{6}$ b) $\dfrac{5}{10}$ c) $\dfrac{3}{12}$

   d) $\dfrac{2}{16}$ e) $\dfrac{9}{27}$ f) $\dfrac{20}{80}$

2) Cancel each of these fractions to their simplest form:

   a) $\dfrac{4}{14}$ b) $\dfrac{30}{70}$ c) $\dfrac{16}{34}$

   d) $\dfrac{24}{42}$ e) $\dfrac{27}{45}$ f) $\dfrac{28}{36}$

3) Cancel down fully each of these fractions:

   a) $\dfrac{33}{55}$ b) $\dfrac{72}{96}$ c) $\dfrac{45}{90}$

   d) $\dfrac{75}{100}$ e) $\dfrac{40}{180}$ f) $\dfrac{68}{116}$

Level 5

Here are six number cards.

| 2 | 5 | 9 | 7 | 4 | 11 |

a) Choose two of these six cards to make a fraction that is equal to $\dfrac{45}{99}$.

b) Choose two of these six cards to make a fraction that is equal to $\dfrac{112}{144}$.

c) Choose three of these six cards to make a fraction that is equal to $\dfrac{28}{175}$.

d) Choose three of these six cards to make the smallest possible fraction.

Level 5

1) Draw ten 4 by 3 rectangles and label them a to j

Shade in the rectangles in the following ratios. ⟶

The first answer is   a

The three shaded squares could have been any three of the squares.
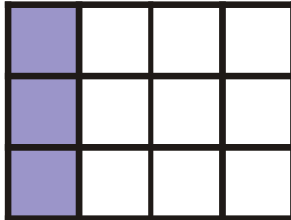
	Shaded	:	Unshaded
a	1		3
b	1		2
c	1		5
d	5		7
e	1		1
f	1		11
g	2		4
h	0.5		2.5
i	0.2		1
j	9		15

2) Write the following ratios in their simplest form:

a) 8 : 12

b) 6 : 10

c) 15 : 10

d) 16 : 4

e) 18 : 16

f) 25 : 15

g) 45 : 15

h) 18 : 27

i) 24 : 30

j) 36 : 48

3) Find the missing numbers in these ratios:

a) 1 : 4 = 2 : ☐

b) 1 : 5 = 6 : ☐

c) 2 : 7 = 8 : ☐

d) 5 : 4 = 15 : ☐

e) 2 : 3 = ☐ : 12

f) 9 : 5 = ☐ : 35

g) 3 : ☐ = 18 : 30

Level 5

Which is orangier: A or B?   ▮ = orange   ▯ = water

You must give convincing reasons for each of your answers

1   A   B

2   A   B

3   A   B

4   A   B

5   A   B

6   A   B

7   A   B

Level 5

1) 17 × 32   = _____

2) 24 × 62   = _____

3) 13 × 156   = _____

4) 1.5 × 22   = _____

5) 7.6 × 2.1   = _____

6) 4.5 × 9.99   = _____

7) 528 × 16   = _____

8) 19.7 × 6.3   = _____

9) 34 × 466   = _____

10) 0.35 × 0.12   = _____

Level 5

1) Work out what the ✱ must be.

a)
```
    1 ✱ 5
      ✱ 2  ×
    ✱ 7 0
  1 3 5 0
  ✱ ✱ ✱ 0
```

b) ×

	✱✱	3
80	4800	✱✱✱
✱	120	6

answer: ✱ ✱ ✱ ✱

c)
```
    4 ✱
      ✱ 7  ×
    3 ✱ 3
    ✱ 9 0
  ✱ ✱ 3
```

d) ×

	✱ 0	✱
✱✱✱	✱✱✱✱	✱✱✱
40	✱✱00	✱✱✱
✱	450	25

answer: 13775

2) A school organises a trip to a museum.

They set off in 13 minibuses, each minibus containing 24 pupils who will each pay to go into the museum.

Entrance to the museum costs £1.20 per person.

a) How many people made the trip?

b) What was the total cost?

Level 5

| N13 | N14 | N15 | N16 | N17 | N18 | C14✓ | C15 | C16 | C17 | C18 | C19 | C20 | C21 |
| A3 | A4 | A5 | A6 | S13 | S14 | S15 | S16 | D6 | D7 |

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C15　Long Division

1) $288 \div 12$ = ____

2) $285 \div 15$ = ____

3) $425 \div 25$ = ____

4) $784 \div 56$ = ____

5) $79.2 \div 22$ = ____

6) $5.89 \div 19$ = ____

7) $893 \div 38$ = ____

8) $9.87 \div 47$ = ____

9) $330.2 \div 13$ = ____

10) $35259 \div 92$ = _____

1)   a)   If 48 luxurious pens cost £768,
how much would one of them cost?

    b)   If 25 tee shirts cost £77.50,
how much would one of them cost?

    c)   If 53 mobile phones cost £2 119.47,
how much would one of them cost?

2)   Cans of juice cost 24p each.

    Wendy has £8.65 to spend.

    a)   What is the maximum number of cans Wendy
can buy?

    b)   How much change does she get?

3)   Find the missing digits.

    a)

$$14 \overline{) \square 0 \, 4} \quad 3\square$$

    b)

$$\square 2 \overline{) 2 \square 2} \quad 2\square$$

Level 5

| N13 | N14 | N15 | N16 | N17 | N18 | C14 | C15 ✓ | C16 | C17 | C18 | C19 | C20 | C21 |
| A3 | A4 | A5 | A6 | S13 | S14 | S15 | S16 | D6 | D7 |

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C16   BODMAS

1) Work out the following:

   a) $3 \times 6 - 2$

   b) $7 + 2 \times 3$

   c) $5 + 3 \times 4 - 1$

   d) $(7 + 1) \times 3$

   e) $5 - 3 \times 2$

   f) $9 - 35 \div 5$

   g) $3 \times 2 + 7 + 5 \times 4$

   h) $20 - 9 \div 3 + 1$

   i) $2 \times (15 - 10) \div 5$

   j) $7 + 2 - 3 \times 4$

   k) $10 \div (2 + 3)$

   l) $10 \div 5 - 8 \div 2$

   m) $7 \times (5 - 2) + 10$

   n) $48 \div (2 + 3 \times 2)$

   o) $4 \times 12 \div 8 - 6$

2) Work out the following:

   a) $3^2 - 2^3$

   b) $25 - (3 - 1)^2$

   c) $8 \times 7 - \sqrt{16}$

   d) $36 \div 2^2 - 3 \times 3$

   e) $5^3 - (3 \times 15 - 2^5)$

   f) $((9 + 1) \times 4) \div 2$

3) Place brackets in the following questions to make the answers correct.

   a) $3 \times 5 - 1 = 12$

   b) $10 + 2 \times 3 = 36$

   c) $7 \times 5 - 2 \times 2 = 42$

   d) $24 \div 6 - 2 = 6$

   e) $3 + 2 \times 6 \div 10 = 3$

   f) $5 \times 5 - 3 \div 4 + 1 = 2$

4)   If $x = 3$ and $y = 7$, work out the following:

   a) $2x - y$

   b) $3y + x^2$

   c) $y^2 - x^2$

   d) $(x + y)^2 - x^3$

   e) $5(y - x) + (y + x) \div 2$

   f) $10xy - (2y - x)^2$

Level 5

| N13 | N14 | N15 | N16 | N17 | N18 | C14 | C15 | C16 ✓ | C17 | C18 | C19 | C20 | C21 |
| A3 | A4 | A5 | A6 | S13 | S14 | S15 | S16 | D6 | D7 |

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1) Use the numbers 6, 3, 2 and 1 plus the operations +, −, ×, ÷ to make the numbers 0 to 9.

   The numbers must be used in the specified order (6, 3, 2, 1).

   They cannot be put together as in 63 for example.

   Signs can be used as many times as you like. Brackets can also be used.

   0 = **6   3   2   1**   5 = **6   3   2   1**

   1 = **6   3   2   1**   6 = **6   3   2   1**

   2 = **6   3   2   1**   7 = **6   3   2   1**

   3 = **6   3   2   1**   8 = **6   3   2   1**

   4 = **6   3   2   1**   9 = **6   3   2   1**

2) Use four 4s plus the operations +, −, ×, ÷ to make the numbers 0 to 9.

   All four 4s must be used. 4s cannot be put together as in 44.

   Signs can be used as many times as you like. Brackets can be used.

   A possible answer for 0 could be **4 ÷ 4 − 4 ÷ 4**

   0 =   5 =

   1 =   6 =

   2 =   7 =

   3 =   8 =

   4 =   9 =

Level 5

1) Find the following:

   a) $\frac{1}{3}$ of 24

   b) $\frac{2}{3}$ of 24

   c) $\frac{1}{5}$ of 30

   d) $\frac{3}{5}$ of 30

   e) $\frac{1}{8}$ of 40

   f) $\frac{5}{8}$ of 40

2) Work out:

   a) $\frac{7}{10}$ of £30

   b) $\frac{3}{7}$ of £84

   c) $\frac{4}{5}$ of £1.50

   d) $\frac{11}{20}$ of £19

   e) $\frac{2}{9}$ of £10.98

   f) $\frac{8}{13}$ of £31.85

3) Julie has £4.50 pocket money every week.
   If she spends $\frac{2}{5}$ of it on a magazine and $\frac{1}{3}$ of it on a dance lesson, how much of the pocket money does she have left?

4) Paul has £7.80 pocket money each week.
   He always saves $\frac{1}{3}$ of it.
   With the remaining money he spends $\frac{5}{8}$ on comics and the rest on sweets.

   (i)   How much does he save?

   (ii) How much is spent on comics?

   (iii) How much does he spend on sweets?

Level 5

1)   a) Find $\dfrac{1}{2}$ of $\left(\dfrac{2}{3}$ of 60$\right)$

    b) Find $\dfrac{3}{4}$ of $\left(\dfrac{1}{2}$ of 80$\right)$

    c) Find $\dfrac{1}{2}$ of $\dfrac{4}{9}$ of $\dfrac{3}{4}$ of 42

2)   a) If $\dfrac{3}{4}$ of a number is 60, what is the number?

    b) If $\dfrac{3}{7}$ of a number is 21, what is the number?

    c) If $\dfrac{4}{9}$ of a number is 12.3, what is the number?

3)   If $\dfrac{1}{2}$ of $\dfrac{1}{5}$ of a number is 6, what is the number?

4)   If $\dfrac{1}{2}$ of $\dfrac{1}{3}$ of $\dfrac{1}{4}$ of $\dfrac{1}{5}$ of a number is 2.5, what is the number?

5)   If $\dfrac{3}{5}$ of $\dfrac{1}{2}$ of $\dfrac{2}{3}$ of a number is 3.8, what is the number?

Level 5

| N13 | N14 | N15 | N16 | N17 | N18 | C14 | C15 | C16 | C17✓ | C18 | C19 | C20 | C21 |
| A3 | A4 | A5 | A6 | S13 | S14 | S15 | S16 | D6 | D7 |

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

1) The temperature is 3°C at midnight and then falls 8 degrees by 6 a.m.

What is the temperature at 6 a.m?

2) Tim has only £8 in his bank account but writes a cheque for £15.

If the cheque is cashed, how much will Tim have in his account?

3) Sue owes £7 to one friend and £6 to another friend.

She writes this in her diary as (-7) + (-6)

a) How much does she owe altogether?

b) What is (-7) + (-6)?

4) Sue still owes £7 to one friend and £6 to another friend but her mother decides to take away the £6 debt by paying it off.

Sue writes this as (-7) + (-6) − (-6)

a) How much does Sue owe now?

b) What is (-7) + (-6) − (-6)?

5) Work out the answers to

a) 6 − 14

b) 2 − 12

c) -1 − 6

d) -3 − 5

e) -7 − 15

6) Work out the answers to

a) 2 − (-3)

b) 6 − (-5)

c) -3 − (-6)

d) -7 − (-2)

e) -20 − (-18)

7) Work out the answers to

a) 5 + (-2)

b) 8 + (-6)

c) 3 + (-8)

d) -4 + (-3)

e) -8 + (-4)

8) Work out the answers to

a) 4 − (+1)

b) 7 − (+5)

c) 1 − (+3)

d) -6 − (+1)

e) -1 − (+6)

Level 5

1) Each magic square below has a magic number written above it.

You must fill in the blank squares so that the rows, columns and diagonals add up to the magic number.

Magic Number is
a) **12**

	10	
	4	0
	-2	9

Magic Number is
b) **15**

2		
15	5	

Magic Number is
c) **-27**

		-22
		-9
		-10

2) Work out which numbers should go in the squares to make the sums correct.

a) 7 + ☐ = 9

b) 7 + ☐ = 5

c) 2 − ☐ = -6

d) 4 − ☐ = 7

e) -5 − ☐ = 4

f) ☐ + 6 = 4

g) ☐ − 9 = -12

h) ☐ − 14 = -30

Level 5

C19

Ratio Questions in Context

1) Share out £20 between Bill and Sue in the ratio 3:2.

2) Divide £60 between Jack and Jill in the ratio 7:3.

3) Debbie and Dave share 200 Smarties in the ratio 1:4. How many Smarties do they each get?

4) Alec, Tony and Sara share £720 in the ratio 1:2:3. How much do they each get?

5) If Dave and Sue share £30 in the ratio 2:3, how much more than Dave does Sue get?

6) Divide £12 between Mick and Sharon in the ratio 5:3.

———————————————

7) Pete and Sandra work part-time in a restaurant. They share the tips in the ratio 3:5.
If Pete gets £30 at the end of the week, how much will Sandra get?

8) Vicky and John share some sweets in the ratio 2:7.
If Vicky ends up with 12 sweets, how many will John have?

9) Len makes some concrete by mixing cement, sand and gravel in the ratio 1:4:3.
If he uses 8 bags of sand, how many bags of cement and gravel will he use?

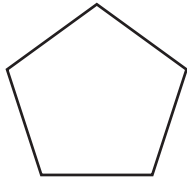10) An old television has a width and height in the ratio 4:3. If the width is 48 cm, what is the height?
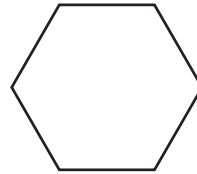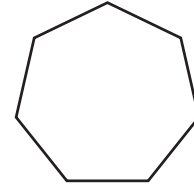
Level 5

C19 Just For Fun

1) Which one of these regular polygons has the number of diagonals and the number of sides in the ratio 2 : 1?

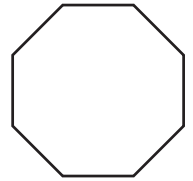   A   B   C   D

2) Two numbers are in the ratio 7 : 3.
If you take one of the numbers away from the other one you get an answer of 24.
What are the two numbers?

3) In a class of 30 pupils the ratio of boys to girls is 2 : 3.
If 6 girls (but no boys) join the class what is the new ratio of boys to girls?

4) Sue, Ted and Ben all have their birthday on the 1st January.

In 2010, Sue, Ted and Ben have ages in the ratio 2 : 3 : 4.

a) If Ted is 15 years old, how old are Sue and Ben?

b) When Sue, Ted and Ben are all five years older, what will be the ratio of their ages? Write the answer in its simplest form.

c) In which year was the ratio of Sue, Ted and Ben's age 1 : 2 : 3?

d) How old was Ben when the ratio of the three ages was 1 : 3 : 5?

e) On what date was the ratio of Sue and Ben's age 1 : 41?

Level 5

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1) 4 litres of orange juice cost £3.20.
   a) What is the cost of 8 litres?
   b) How much would 20 litres cost?
   c) How much would you pay for 6 litres?
   d) What is the cost of 5 litres?

2) 15 voice minutes cost 45p.
   What is the cost of
   a) 30 voice minutes?
   b) 150 voice minutes?

3) If £1 is worth 1.12 euros, how many euros would you get for £150?

4) Use direct proportion to solve the following problems:
   a) 5 litres of water cost £3.00.
      How much would 9 litres cost?
   b) A recipe for two people uses 90 g of flour.
      How much flour is needed for 5 people?
   c) 20 blank CD-Roms cost £3.20.
      How much do 75 CD-Roms cost?
   d) A litre of water costs 62p.
      What is the cost of 2.5 litres of water?
   e) 3 kg of cheese costs £7.50
      What is the cost of 6.5 kg of cheese?
   f) 2 litres of smoothie contains 900 ml of orange juice.
      How much orange juice is in 8.5 litres of smoothie?
   g) A 120 ml carton of yoghurt contains 12 g of sugar.
      How much sugar would be in a 200 ml carton of yoghurt?

Level 5

N13 N14 N15 N16 N17 N18 C14 C15 C16 C17 C18 C19 C20 C21
A3 A4 A5 A6 S13 S14 S15 S16 D6 D7

1)

Miles	Kilometres
5	8
10	
	24
	32
50	

a) Use direct proportion to complete this conversion table.

b) The distance between London and Birmingham is 120 miles.
Use the table to work out this distance in kilometres.

c) The distance between London and Paris is 460 kilometres.
Use the table to work out this distance in miles.

2) Here are three offers for voice minutes on a mobile phone.

A

Minutes	Cost
1	£0.04
5	£0.20
40	£1.60

B

Minutes	Cost
2	£0.24
10	£1.00
100	£7.00

C

Minutes	Cost
10	£0.70
50	£3.50
60	£4.20

In which of the offers are the numbers in direct proportion?
In each case, explain your answer.

3) A jar has 200 sleeping flies in it and the lid is firmly on.
The weight of the jar, when empty is 1 kg.
The weight of the jar and sleeping flies is 1.9 kg (1900 g).

a) If all the flies are the same weight, what is the weight of one fly?

b) Tina shakes the jar so that all the flies are now awake and flying around.
What will the weight of the jar of flies be, now?

Level 5

1)

London	*All distances are in miles.*		
195	Nottingham		
300	100	Manchester	
330	159	56	Liverpool

a)   Write down the distance between London and Nottingham.

b)   Write down the names of the two cities which are
(i)   The furthest apart.
(ii)   The least distance apart.

c)   Peter travels from London to Manchester where he collects a parcel.
He then delivers the Parcel in Nottingham before returning to London.
Work out the total distance travelled by Peter.

2)   Here is part of a railway timetable

Stockport	05:26	06:16	06:55	07:15	07:55
Stoke	05:55	06:45	07:24	-	-
Stafford	06:12	-	07:41	-	08:41
Euston	08:09	08:26	-	09:11	10:06

a)   Rosie wants to travel from Stockport to Euston. She must
arrive in Euston before 09:00.

(i)   What is the latest time she could depart from Stockport?

(ii)   How long will her journey last?

b)   James gets to Stockport station at 07:00.
How long will he have to wait for the next train to Stafford?

c)   Alex travels to Euston.
She gets on the 07:24 train from Stoke.
How long will her journey take?

Level 5

1)

London	*All distances are in miles.*			
22	Stevenage			
75	48	Peterborough		
195	165	130	Doncaster	
235	210	170	45	York

Emma lives in Doncaster.
She has to drive to Peterborough to pick up her friend, David, and then continue on to London to attend a graduation ceremony which begins at 11 am.
The ceremony will last two hours and she will then return to Doncaster with David.

a)   How far does Emma travel in order to get to London with David?

b)   If Emma averages 50 mph on the return trip, at what time would she be back in Doncaster?

2)   The train route diagram show the times it takes to travel from Chester to other major stations on the line.

Use the information in the diagram to complete the following timetables.

Chester	04:22
Wrexham	
Gobowen	
Shrewsbury	
Welshpool	
Newtown	

Wolverhampton	16:42
Telford	
Wellington	
Shrewsbury	
Gobowen	
Wrexham	
Chester	
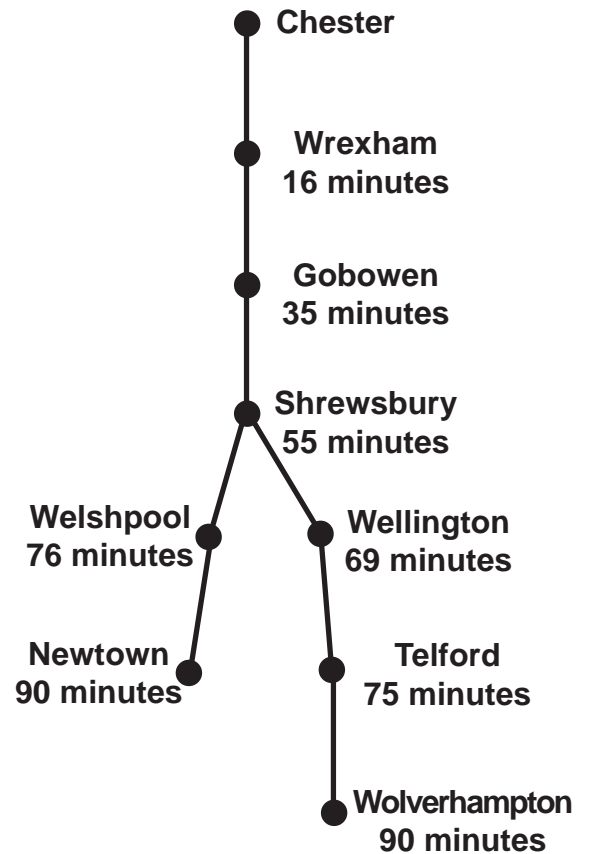
Chester

**Wrexham
16 minutes**

**Gobowen
35 minutes**

**Shrewsbury
55 minutes**

**Welshpool
76 minutes**

**Wellington
69 minutes**

**Newtown
90 minutes**

**Telford
75 minutes**

**Wolverhampton
90 minutes**

Level 5

> What expression do I have if I think of a number, double it and then add three?
>
> **Answer:** $2x + 3$

> Say what the expression $4x + 17$ means in words.
>
> **Answer:** Take a number, multiply it by four and then add seventeen.

1) Write down the expression you will have if you think of a number (let x be the number) and then:

   a) add three to it

   b) double it

   c) multiply it by three and then subtract four

   d) multiply it by itself

   e) divide it by two

   f) divide it by two and then add one

   g) add three to it and multiply the result by two

   h) multiply it by five, add four, divide the result by two

2) Say what the following expressions mean in words.

   a) $x + 6$

   b) $x - 7$

   c) $8x$

   d) $4x + 2$

   e) $\dfrac{x}{5}$

   f) $6(x + 7)$

   g) $4(3x - 1)$

3) If $s = 2v$, work out the value of s when $v = 7$

4) If $y = 3t + 4$, work out the value of y when $t = 5$

5) If $g = 2t - 1$, work out the value of g when $t = 9$

6) If $f = 2(t + 8)$ and $t = 3$, find the value of f

7) If $d = 3(2e - 3)$ and $e = 5$, find the value of d

8) If $c = 4$ and $d = 3$, find the value of:

   a) $2c$

   b) $2c - d$

   c) cd

   d) $5c + 2d$

   e) $10cd$

   f) $2(c + d)$

   g) $5(3c - 2d)$

Level 5

The body mass index (BMI) is a measure used to show if an adult is at a healthy weight. It doesn't apply to children, only adults.

Here is a formula for calculating BMI

BMI = (weight in kg) ÷ (height in m) ÷ (height in m)

A person with BMI between 18.5 and 25 is at a healthy weight.

A person with BMI less than 18.5 is underweight.

A person with BMI between 25 and 30 is overweight.

A person with BMI over 30 is obese.
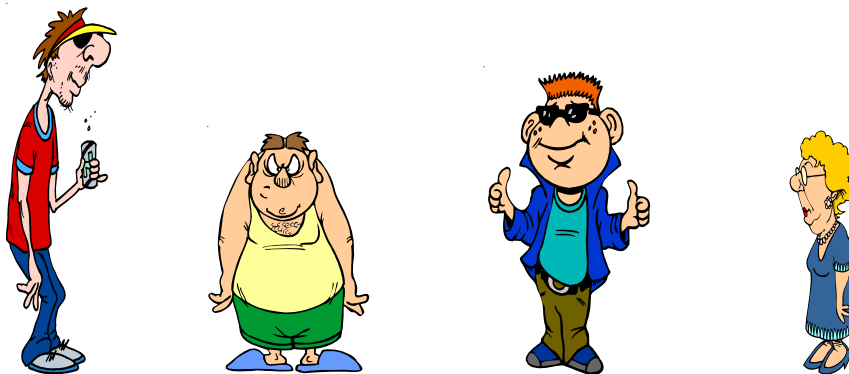
Here are the heights and weights of the four people above.
They are in no particular order.

Height (m)	1.74	1.82	1.62	1.62
Weight (kg)	70	57	55	74
BMI				

a)   Work out the BMI for each height and weight and put them in the table. Give your answers to the nearest whole number.

b)   Match each height, weight and BMI with the correct person.

c)   For each person, decide whether he/she is underweight, healthy, overweight or obese - write the answer next to each person.

d)   A woman is 1.65 m tall and weighs 45.6 kg. She worries that she is overweight. Is she right?

Level 5

N13 N14 N15 N16 N17 N18 C14 C15 C16 C17 C18 C19 C20 C21
A3 A4 A5 A6 S13 S14 S15 S16 D6 D7

1) Write down the coordinates of the crosses labelled A to J.
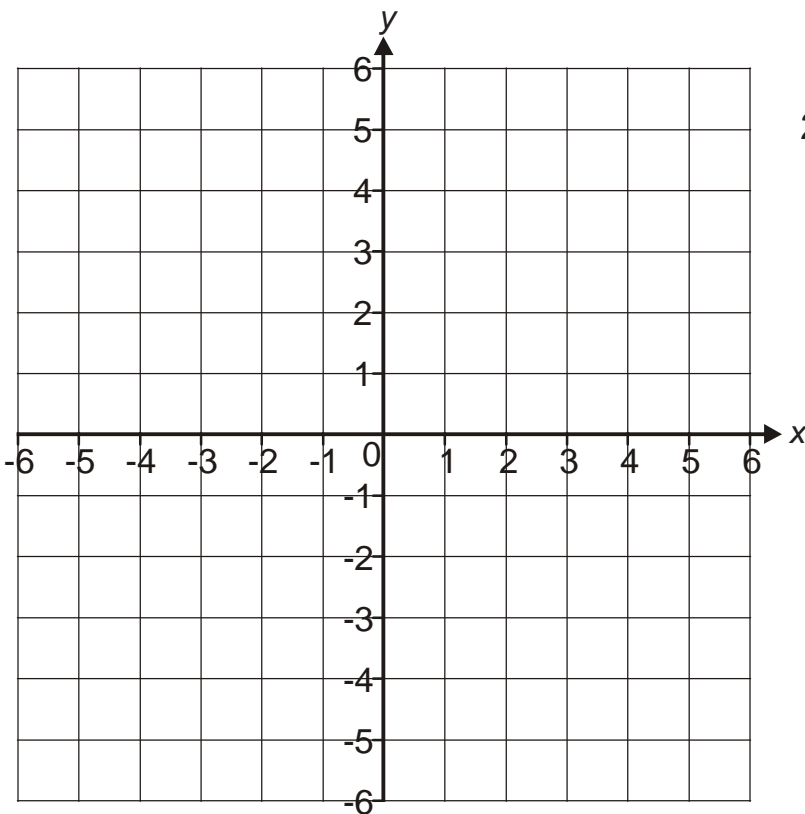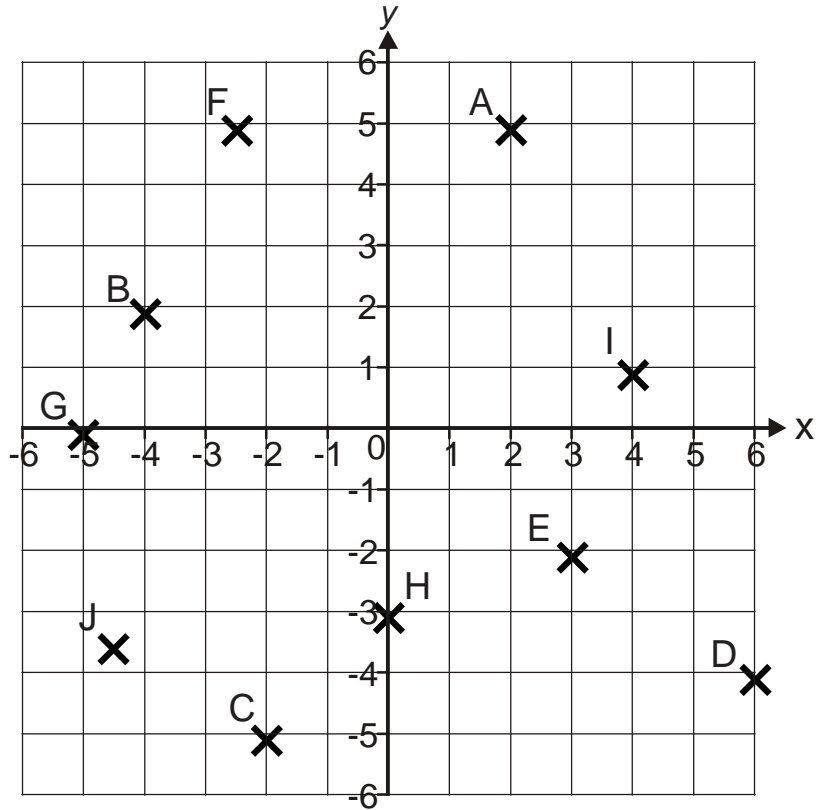
2) Put crosses at the following points and label them with the correct letters.

A (-5, 3)

B (2, -4)

C (-2, -6)

D (5.5, 3)

E (0, 0)

F (-3, 0)

G (-6, -5)

H (0, -5)

Level 5

1) Below there are seven well-known phrases or expressions.
   Expression (a) is "Clean underwear".
   Try and work out the other six.

(a)

| WEAR CLEAN |

(b)

| POTOOOOOOOOO |

(c)

| DR doo |

(d)

| HOROBOD |

(e)

| O _ E R _ T _ O _ |

(f)

| XMASCARA |

(g)

| must get here
must get here
must get here |

Every question on this page can be answered if you just see them in the right way.
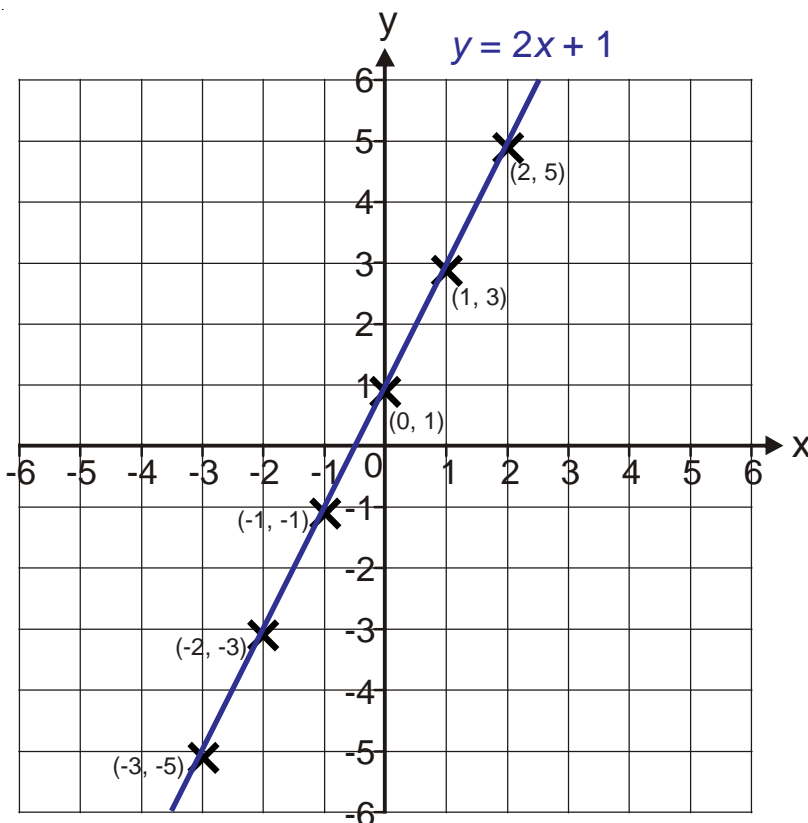
$y = 2x + 1$

For every point on the line if you multiply the x coordinate by 2 and then add 1 you always get the y coordinate.
This is why we call the line $y = 2x + 1$

2) Plot the following points on the grid, draw a line through the points and try and work out the name of the line.

a) (6, 6), (5, 5), (4, 4), (3, 3), (2, 2)
   (1, 1), (0, 0), (-1, -1), (-2, -2)
   (-3, -3), (-4, -4), (-5, -5), (-6, -6)

b) (6, 3), (4, 2), (2, 1), (0, 0), (-6, -3)

c) (4, 5), (3, 3), (2, 1), (1, -1), (-1, -5)

d) (5, 6), (5, 5), (5, 4), (5, 3), (5, 2)
   (5, 1), (5, 0), (5, -1), (5, -2), (5, -6)

Level 5

| N13 | N14 | N15 | N16 | N17 | N18 | C14 | C15 | C16 | C17 | C18 | C19 | C20 | C21 |
| A3 | A4 | A5 | A6 | S13 | S14 | S15 | S16 | D6 | D7 |

1) Draw the following lines on the axes to the right:

   a) $x = 3$

   b) $x = -4$

   c) $y = 1$

   d) $x = 7.5$

   e) $y = -3$

   f) $y = 4.5$
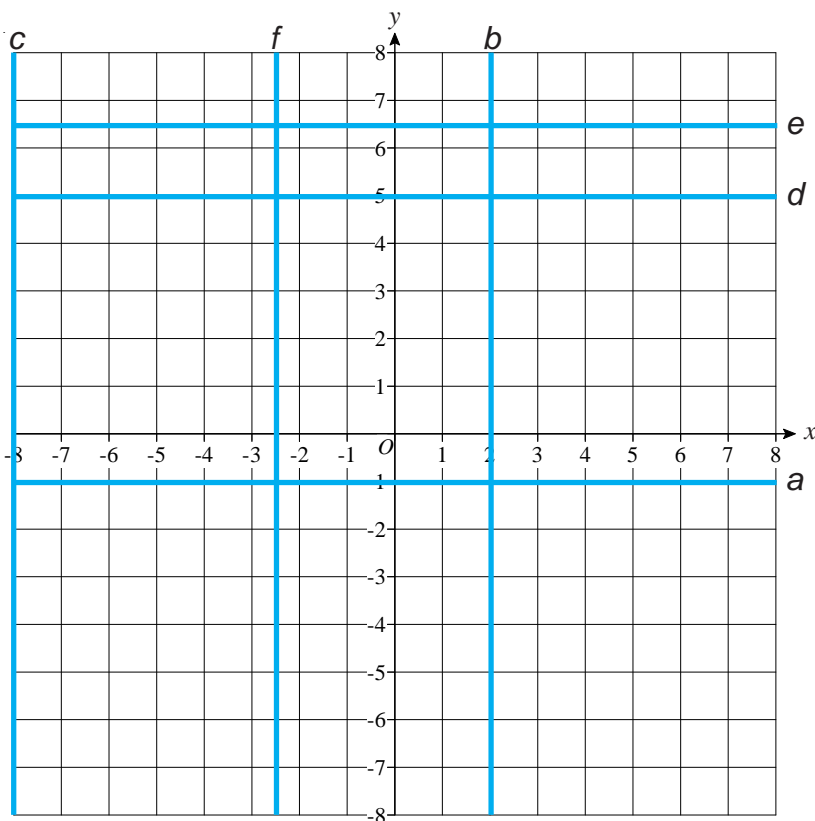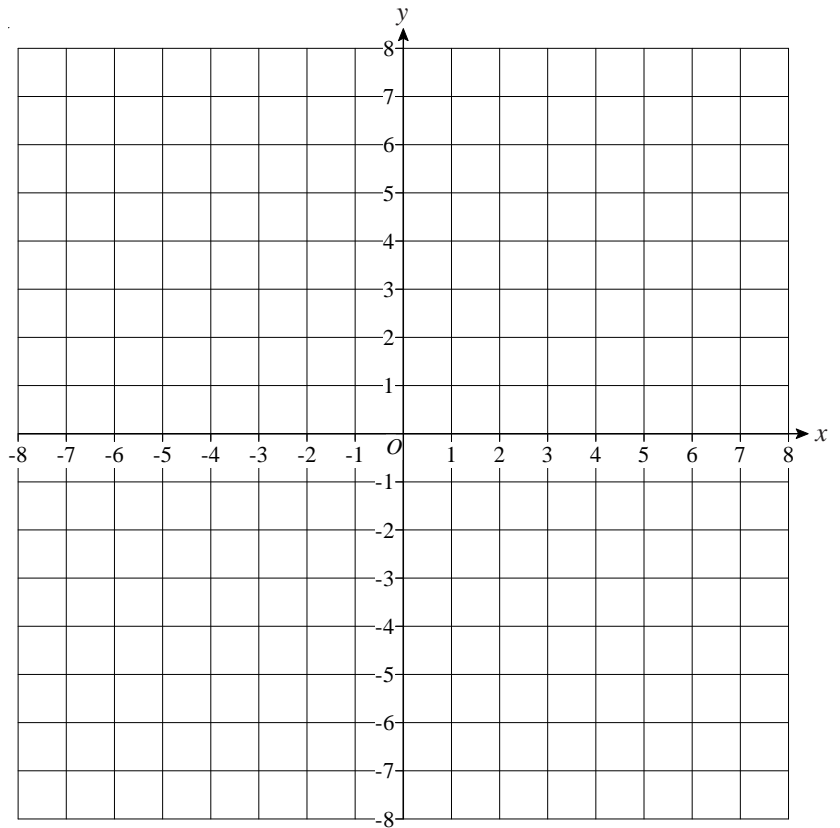
2) Name all the lines drawn on the axes on the left.

   Line *a* is: _____

   Line *b* is: _____

   Line *c* is: _____

   Line *d* is: _____

   Line *e* is: _____

   Line *f* is: _____

Level 5

1) (i) Plot the points
(0, 1)
(1, 2)
(2, 3)
(3, 4)
(4, 5)
(5, 6)

(ii) Draw a line through these coordinates.

(iii) Name the line.

2) (i) Plot the points
(0, 0)
(1, 2)
(2, 4)
(3, 6)
(4, 8)
(5, 10)

(ii) Draw a line through these coordinates.

(iii) Name the line.

3) (i) Plot the points
(0, 1)
(1, 3)
(2, 5)
(3, 7)
(4, 9)
(5, 11)

(ii) Draw a line through these coordinates.

(iii) Name the line.
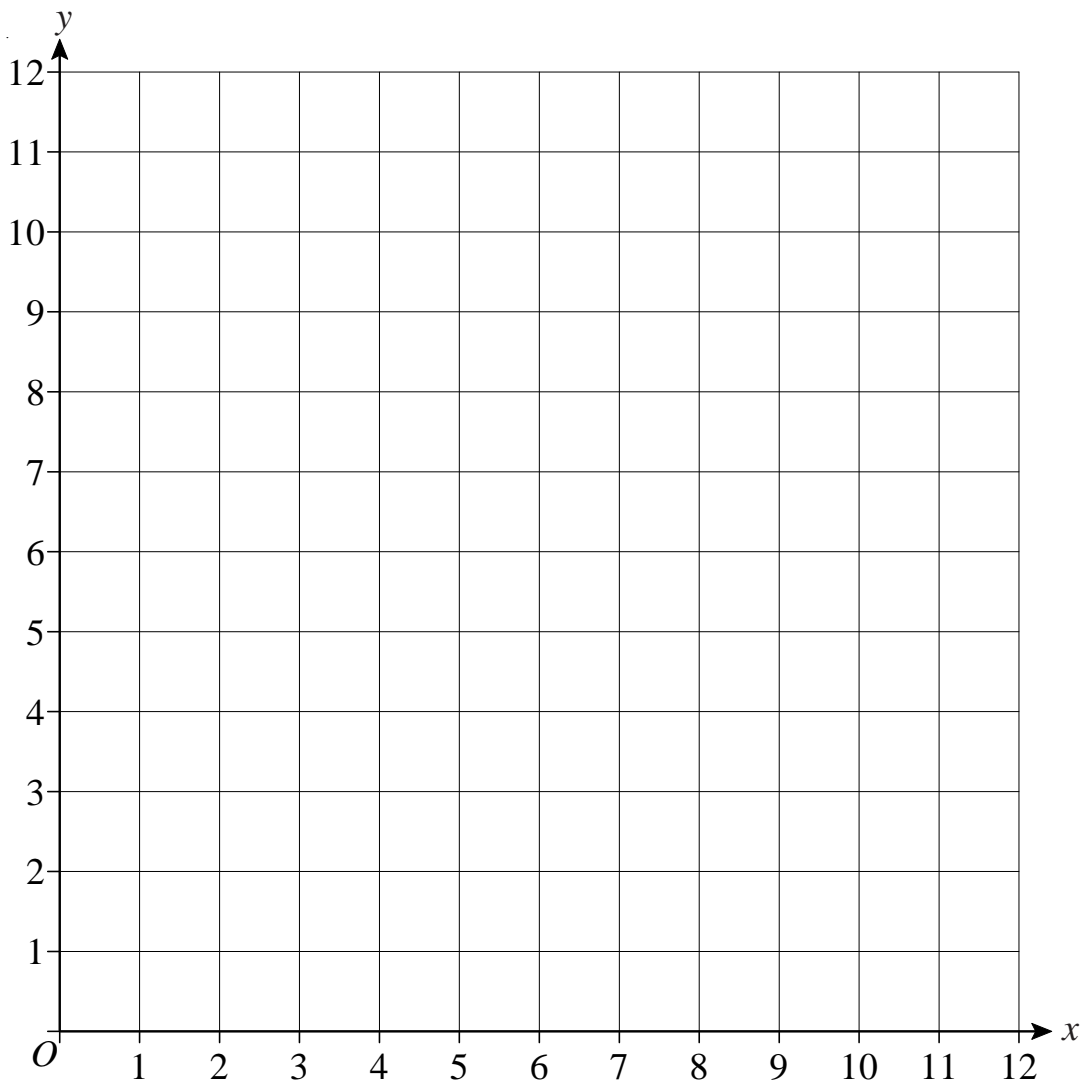
Level 5

N13 N14 N15 N16 N17 N18 C14 C15 C16 C17 C18 C19 C20 C21
A3 A4 A5 A6 S13 S14 S15 S16 D6 D7

1) Find the **output** for each of these function machines.

a) 3 ⟶ ×5 ⟶

b) 7 ⟶ +5 ⟶

c) 6 ⟶ ×2 ⟶ −3 ⟶

d) 13 ⟶ +5 ⟶ ÷3 ⟶

e) 10 ⟶ ÷2 ⟶ −7 ⟶

f) 7 ⟶ −4 ⟶ ×2.5 ⟶

2) Find the **input** for each of these function machines.

a) ⟶ −5 ⟶ 8

b) ⟶ ÷4 ⟶ 25

c) ⟶ ×2 ⟶ −1 ⟶ 19

d) ⟶ ÷5 ⟶ +8 ⟶ 18

e) ⟶ −7 ⟶ ÷2 ⟶ 3.5

f) ⟶ ×19 ⟶ −4 ⟶ -4

Level 5

N13 N14 N15 N16 N17 N18 C14 C15 C16 C17 C18 C19 C20 C21
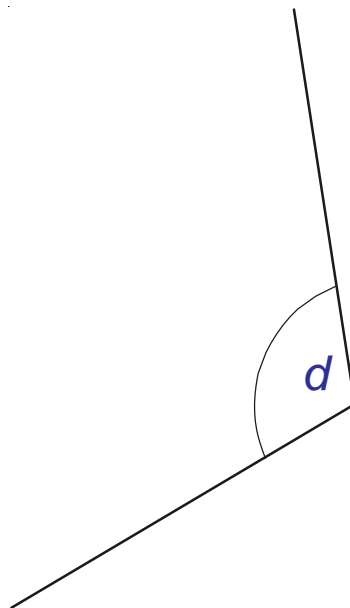A3 A4 A5 A6 S13 S14 S15 S16 D6 D7

Complete the diagram below. Every time you see dashes like this ---------,
you need to write the correct number or expression.

One of them (**5x – 7**) has already been done for you.
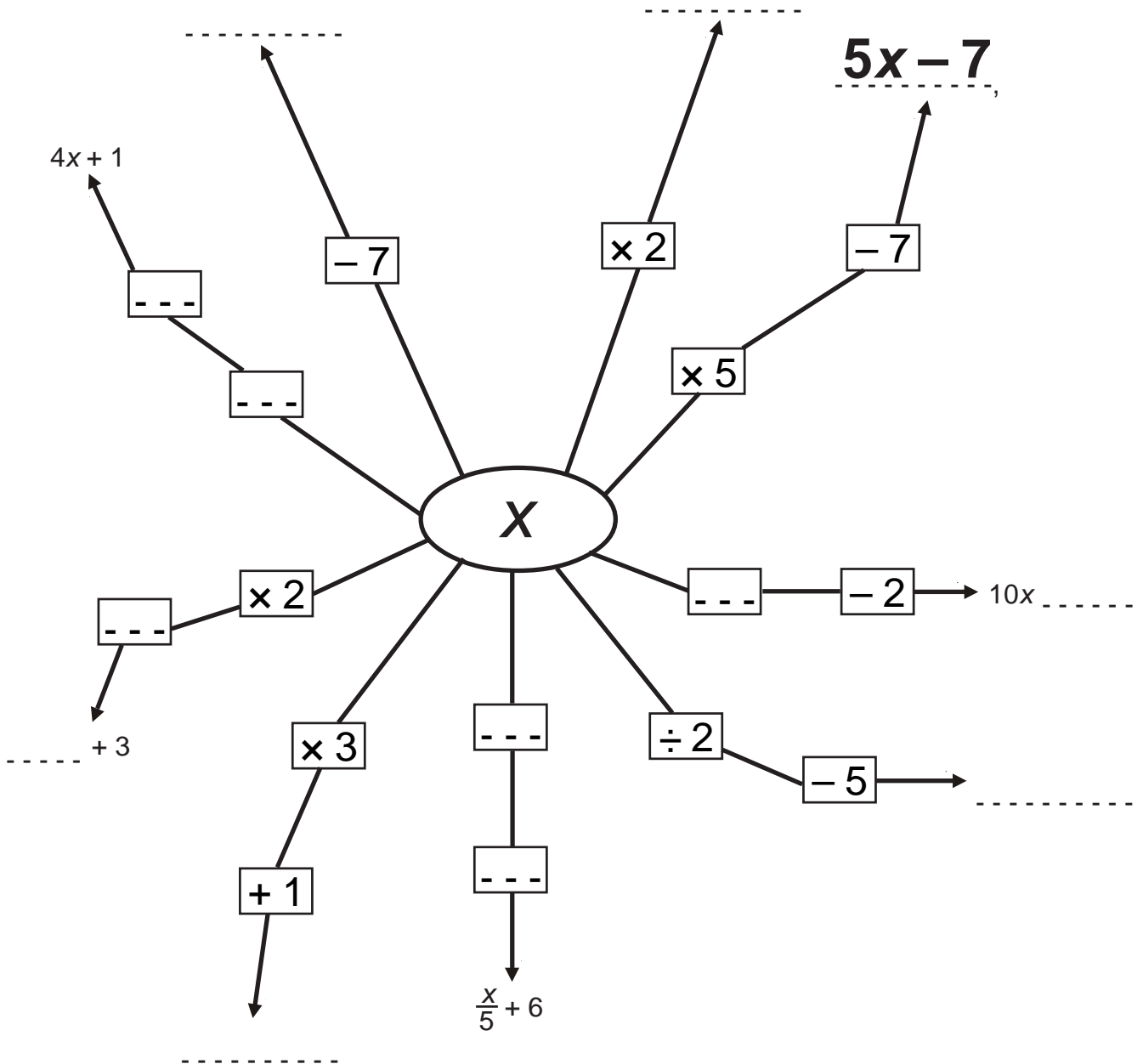
$4x + 1$

-7

$\times 2$

5x – 7

-7

$\boxed{- - -}$

$\times 5$

$\boxed{- - -}$

$\times 2$

X

$\boxed{- - -}$

-2

$10x$

$\boxed{- - -}$

$+3$

$\times 3$

$\boxed{- - -}$

$\div 2$

-5

$+1$

$\boxed{- - -}$

$\frac{x}{5} + 6$

Level 5

| N13 | N14 | N15 | N16 | N17 | N18 | C14 | C15 | C16 | C17 | C18 | C19 | C20 | C21 |
| A3 | A4 | A5 | A6 | S13 | S14 | S15 | S16 | D6 | D7 |

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Page 62B

S13 Symmetries of 2D Shapes

1) *For figures a to h, work out*

    i)   The order of rotational symmetry.

    ii)   How many lines of symmetry it has.

a)

b)

c)

d)

e)

f)

g)

h)
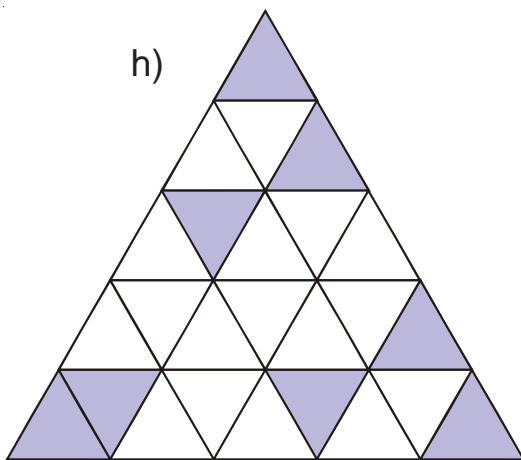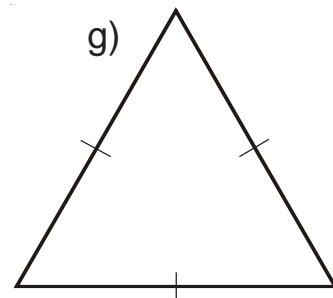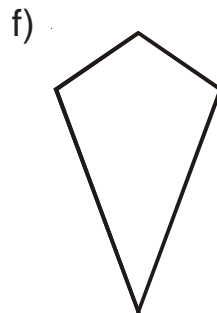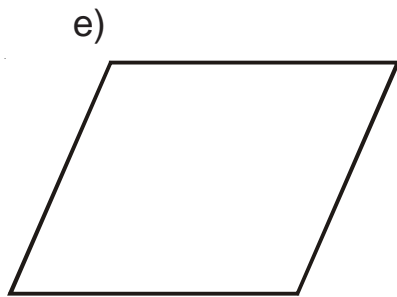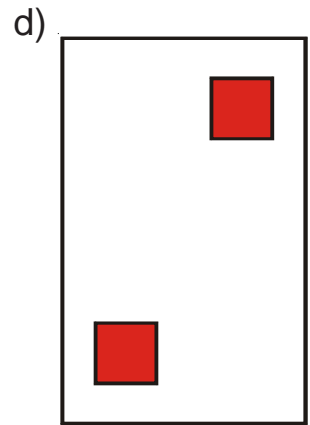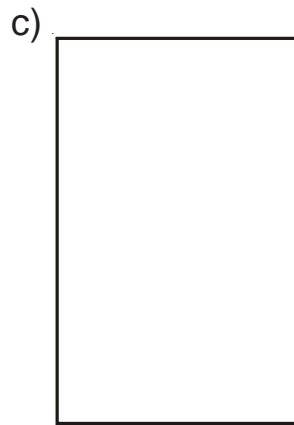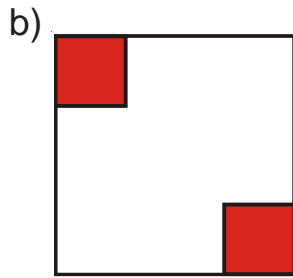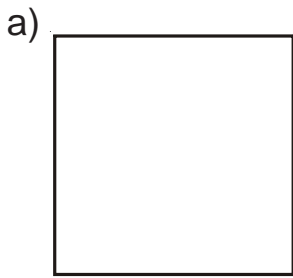
2) Shade in six more triangles so that this figure has rotational symmetry order 3
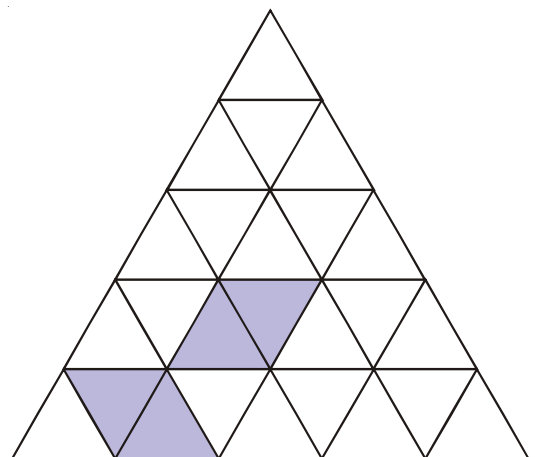
Level 5

1) a) Shade in one square so that this shape has rotational symmetry of order 2.
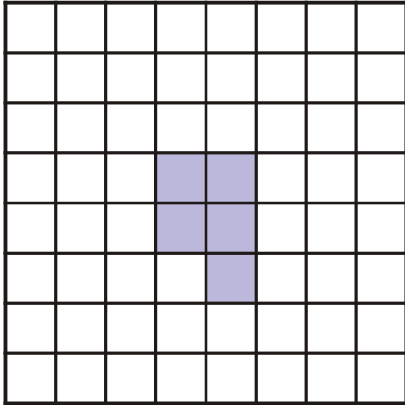
b) Shade in a different square so that this shape has rotational symmetry of order 2.
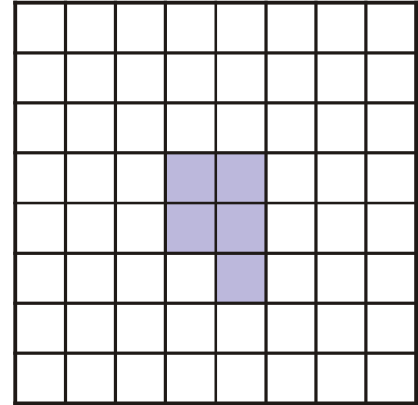
2) Shade three more squares so that the grid has rotational symmetry of order 4.
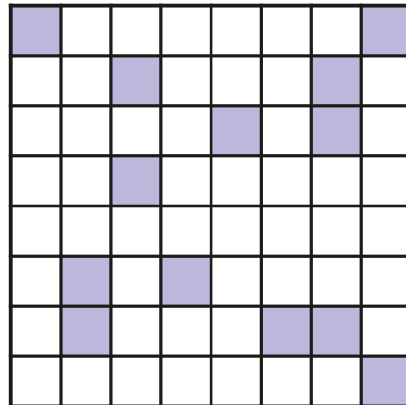
3) The diagram shows a poster which Chloe has on her wall.
When Chloe was standing on her head, looking in a mirror on the opposite wall at the poster on the wall behind her, how many letters could still be read the normal way?

CHLOE
BAXTER

Level 5

1) Each of the angles below can be described as an acute angle, an obtuse angle, a reflex angle or a right angle. Decide which each of them are.

a

b

c

d

e *f*

g
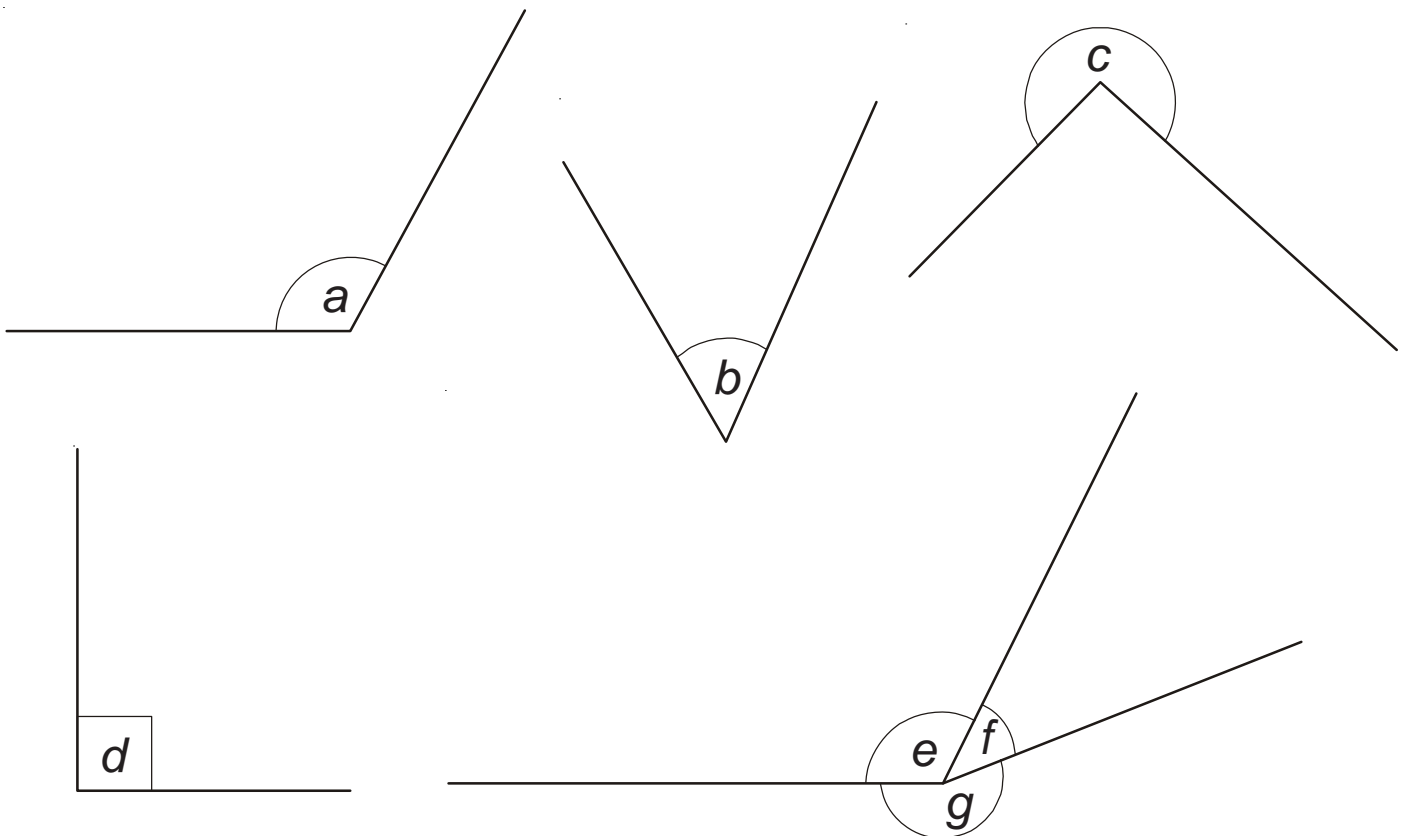
2) a) Draw a triangle which has three acute angles.

   b) Draw a triangle which has one obtuse angle and two acute angles.

   c) Draw a quadrilateral (4-sided shape) which has one reflex angle and three acute angles.

   d) Draw a quadrilateral which has one right angle, one acute angle and two obtuse angles.

   e) Draw a quadrilateral which has two obtuse angles and two acute angles.

Level 5

Use a protractor to measure the
angles below.

a

b

c

d

e

Level 5

Use a protractor to measure the angles below.

a

b

c

d

e
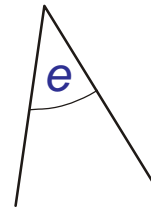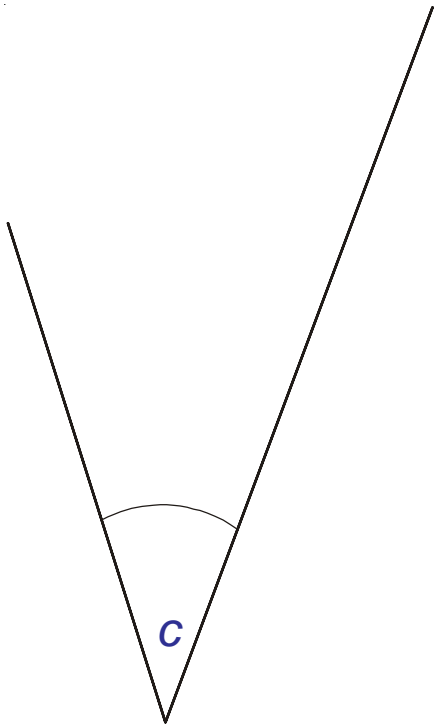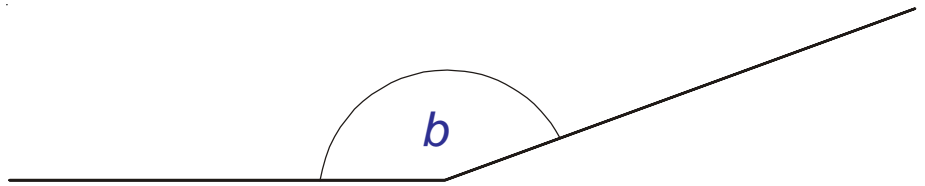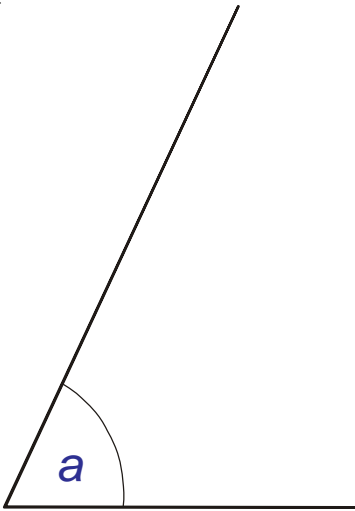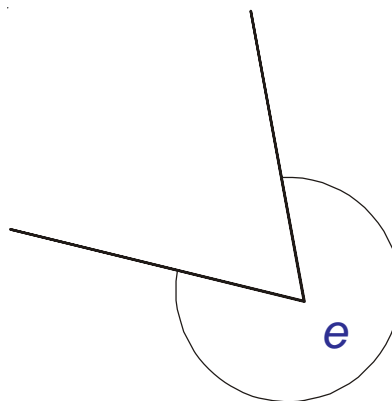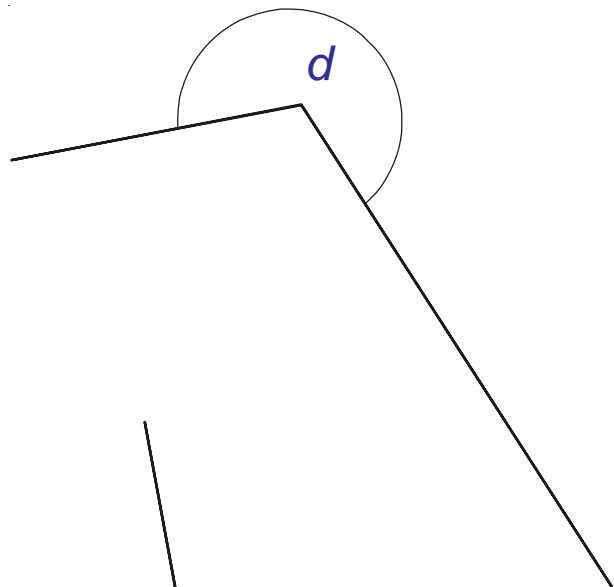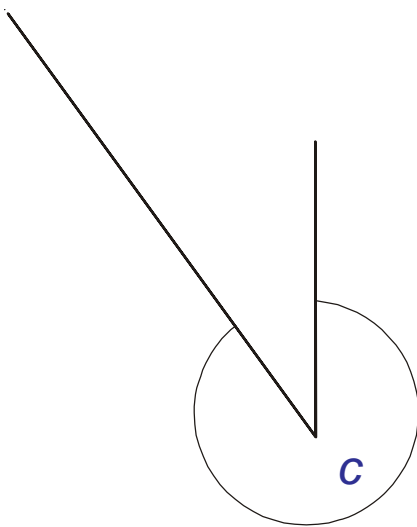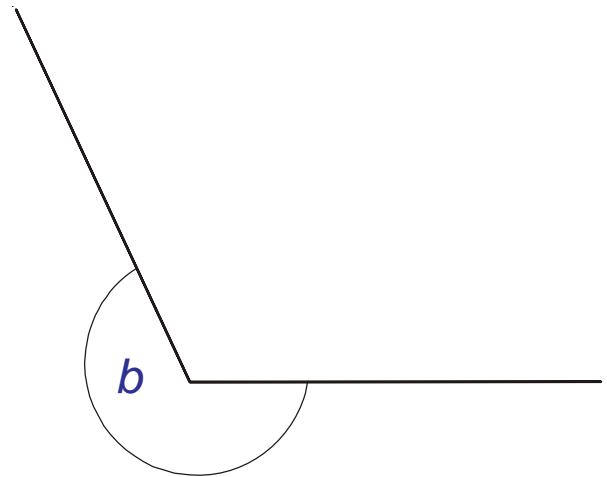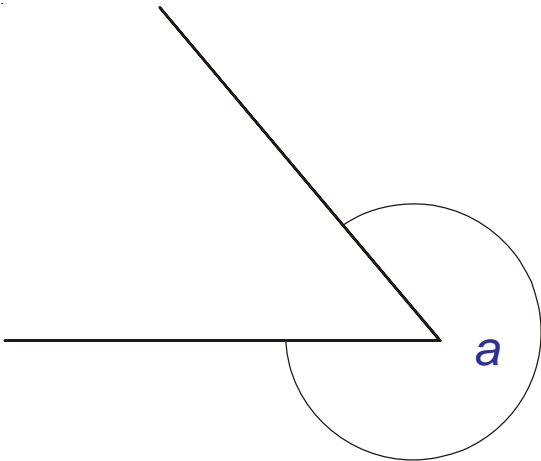
Level 5

Draw the angle where you see the dot.
Here is an example:

40° ————————•
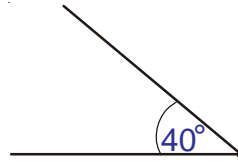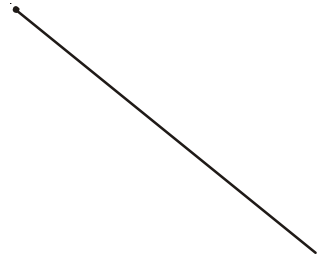
40°

a) 70° ————————————•

b) 135°

c) 28°

d) 171°
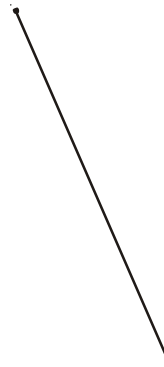
Level 5

Draw the angle where you see the dot.

a) 340°

b) 305°

c) 245°

d) 193°

Level 5

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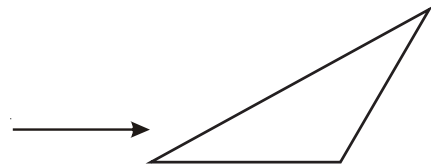
1)   a)   Measure, very carefully, angles *A*, *B* and *C*.

      b)   Add the angles together.

      c)   What do they add up to?

      d)   Tear or cut along the wavy lines.

      e)   Fit the angles together to form a straight line.

A

Tear or cut here

B   *C*
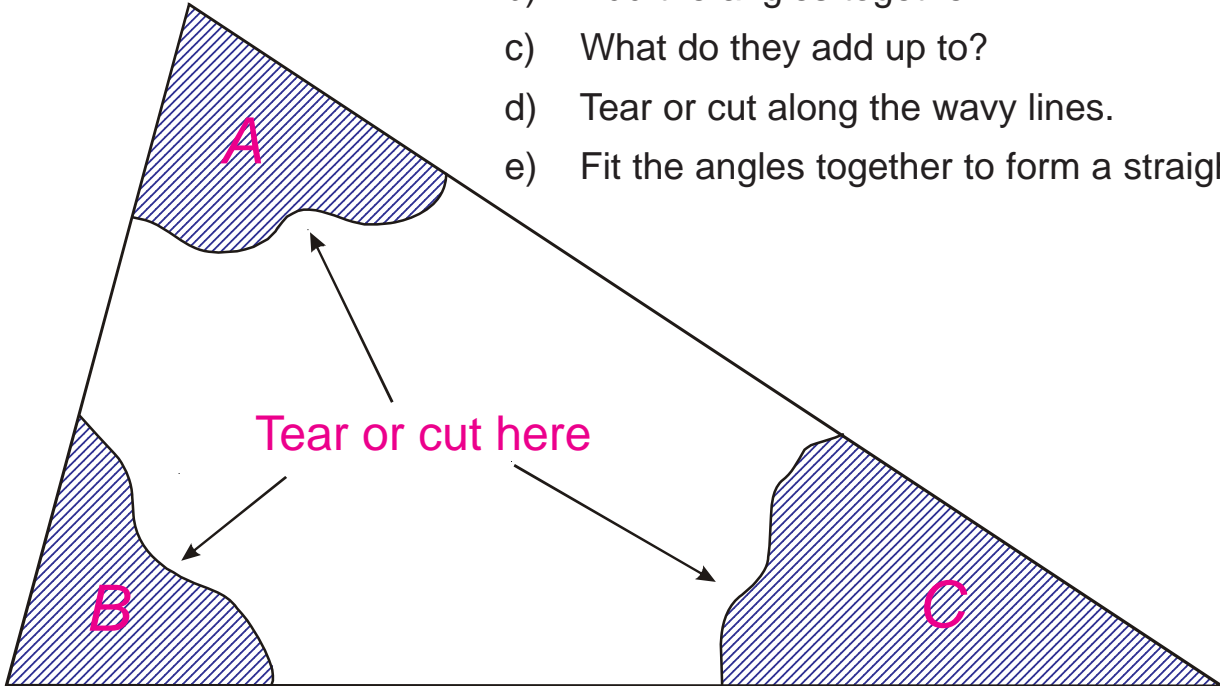
2)   a)   Draw some more triangles.
        Don't forget ones like these ⟶

      b)   For each triangle, label the angles *A, B* and *C*.
        It doesn't matter which is which.
        Fill in the table below.

	Angle *A*	Angle *B*	Angle *C*	All three angles added together
Triangle 1				
Triangle 2				
Triangle 3				
Triangle 4				

Level 5

1) Work out the size of angles *a* to *h*.
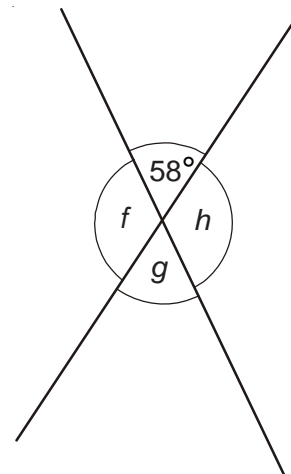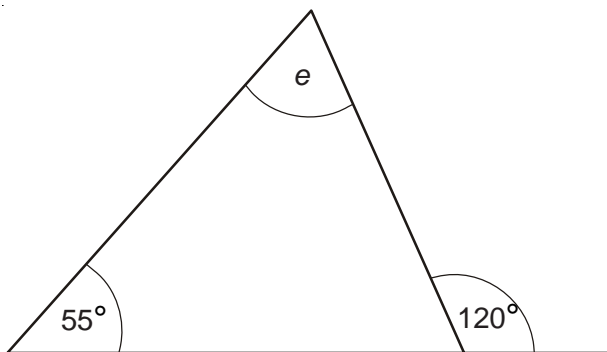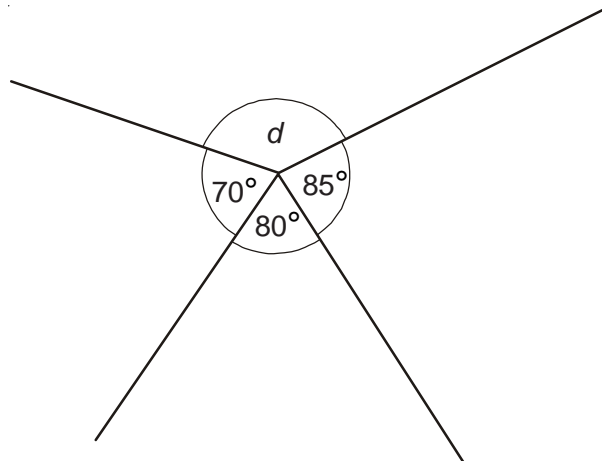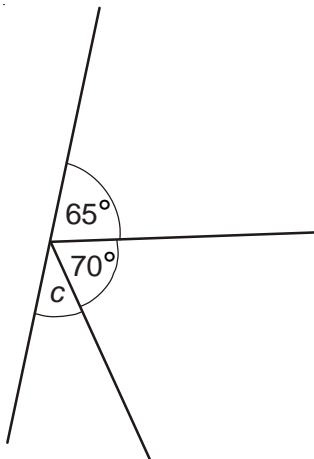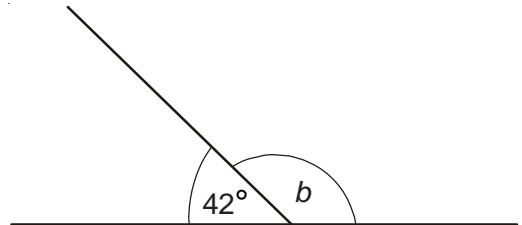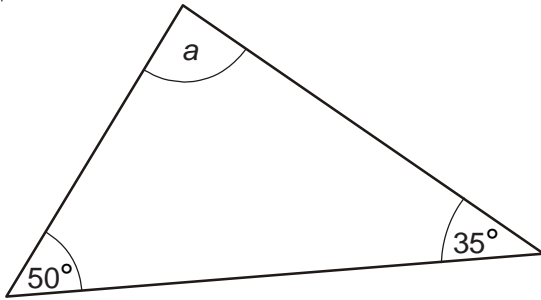
a

50°

35°

42° *b*

65°

70°

c

d

70° 85°

80°

e

55° 120°

58°

f *h*

g

Level 5

Question 1 is tricky.
Question 2 is **very** challenging - *some teachers struggle*

1) Find angles *a*, *b* and *c*

2) *ABCD* is a rhombus (all four sides the same length)
   ABE is an isosceles triangle in which *BA = BE*
   Angle *AED* = 110°
   Work out the size of angle x

Level 5

N13 N14 N15 N16 N17 N18 C14 C15 C16 C17 C18 C19 C20 C21
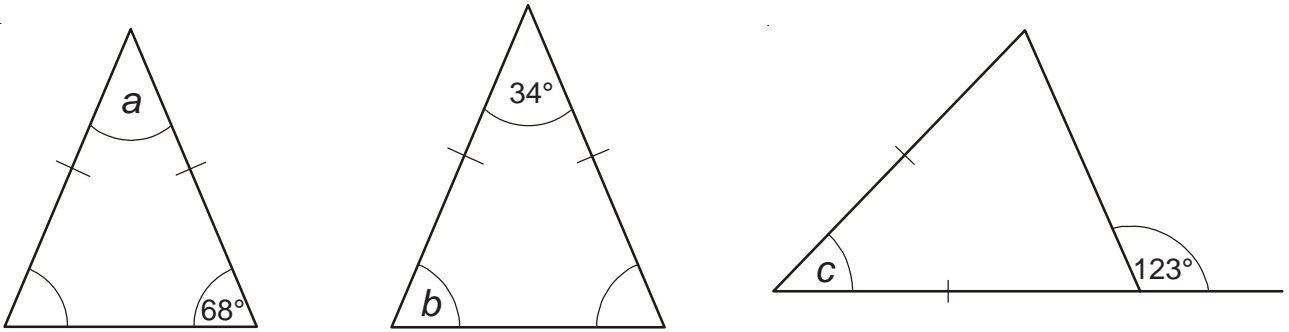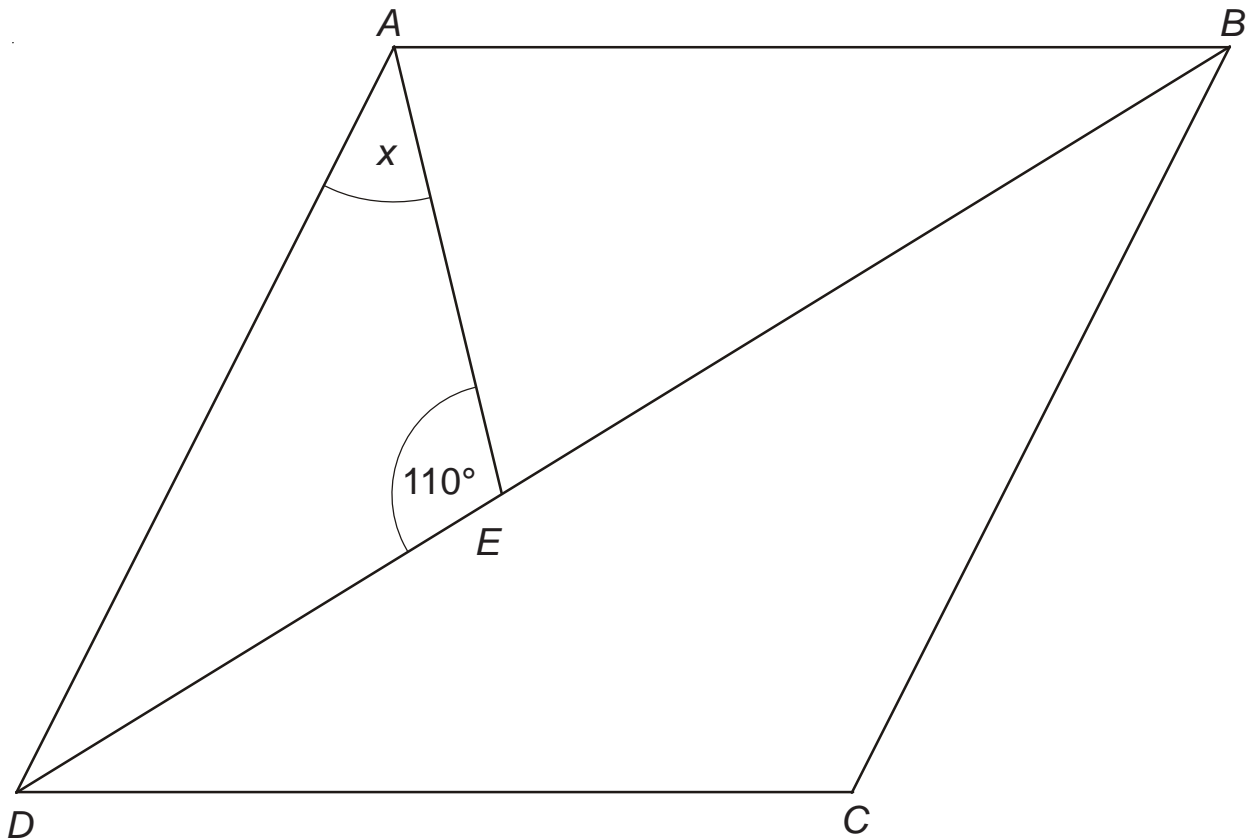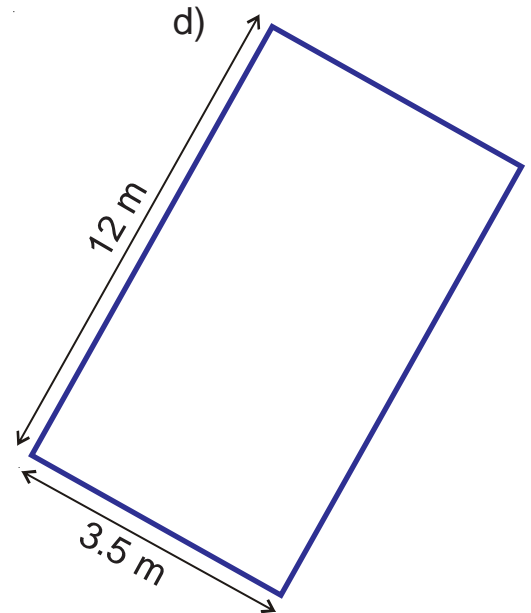A3 A4 A5 A6 S13 S14 S15 S16 D6 D7

S16 Areas of Rectangles

1) Find the areas of the following four rectangles.

a)

9 cm

4 cm

b)

5 m

3 m

c)

2.8 cm

9.6 cm

d)

12 m

3.5 m
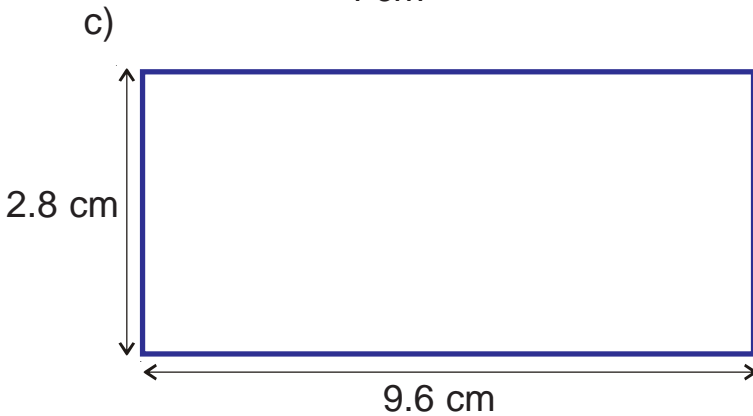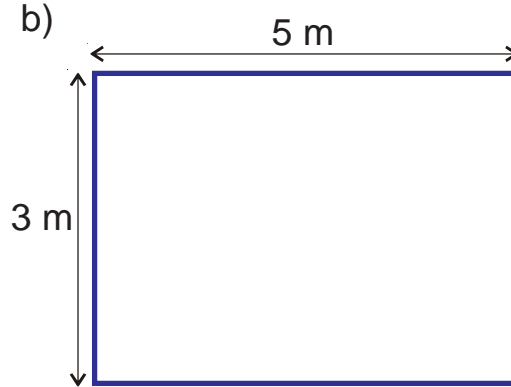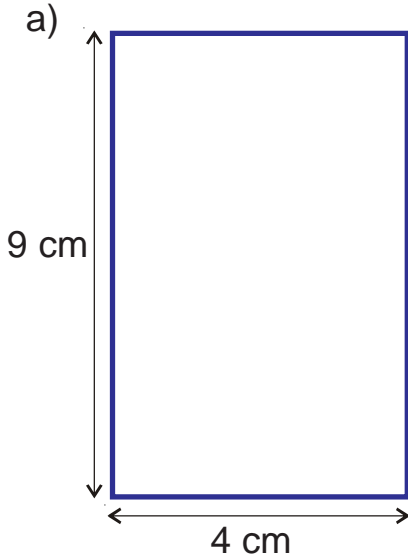
2) Find the lengths of the missing sides.
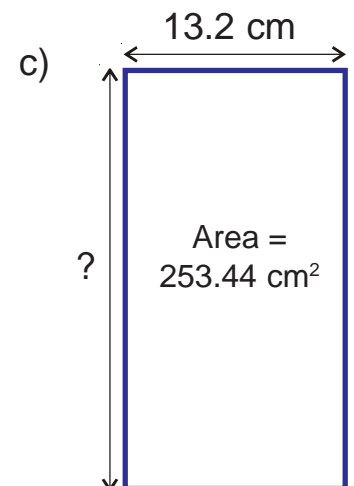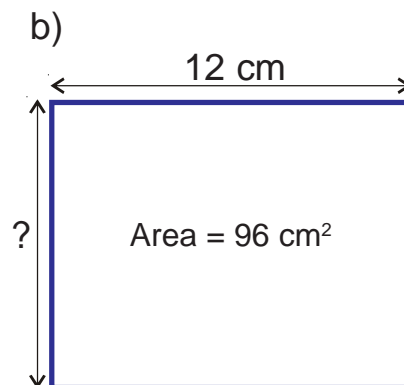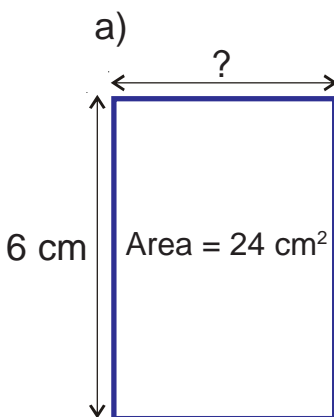
a)

?

6 cm | Area = 24 cm²

b)

12 cm

? | Area = 96 cm²

c)

13.2 cm

? | Area = 253.44 cm²

Level 5

1) Find the area of the shaded section.

10 cm

6 cm

8 cm

14 cm
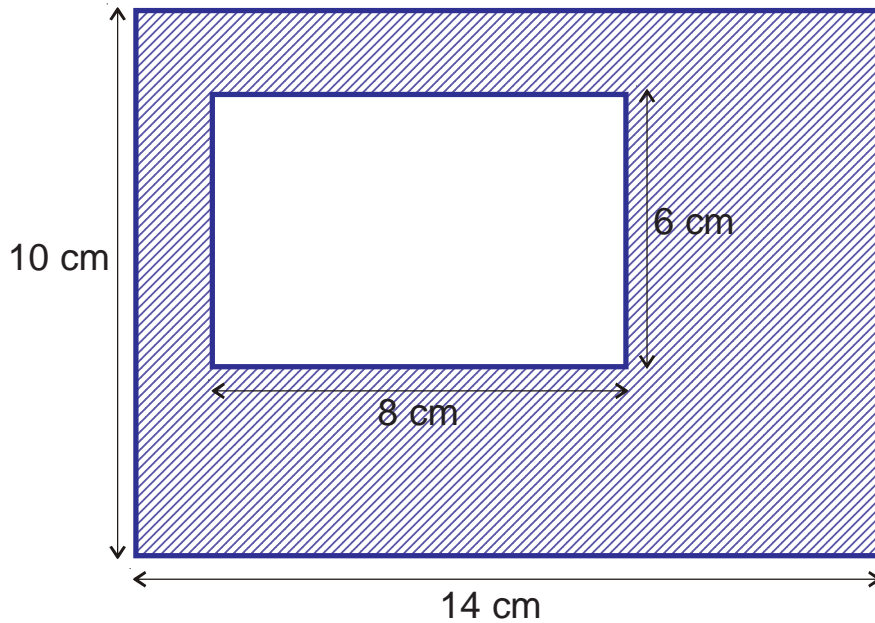
2) Find the area of the shape below.
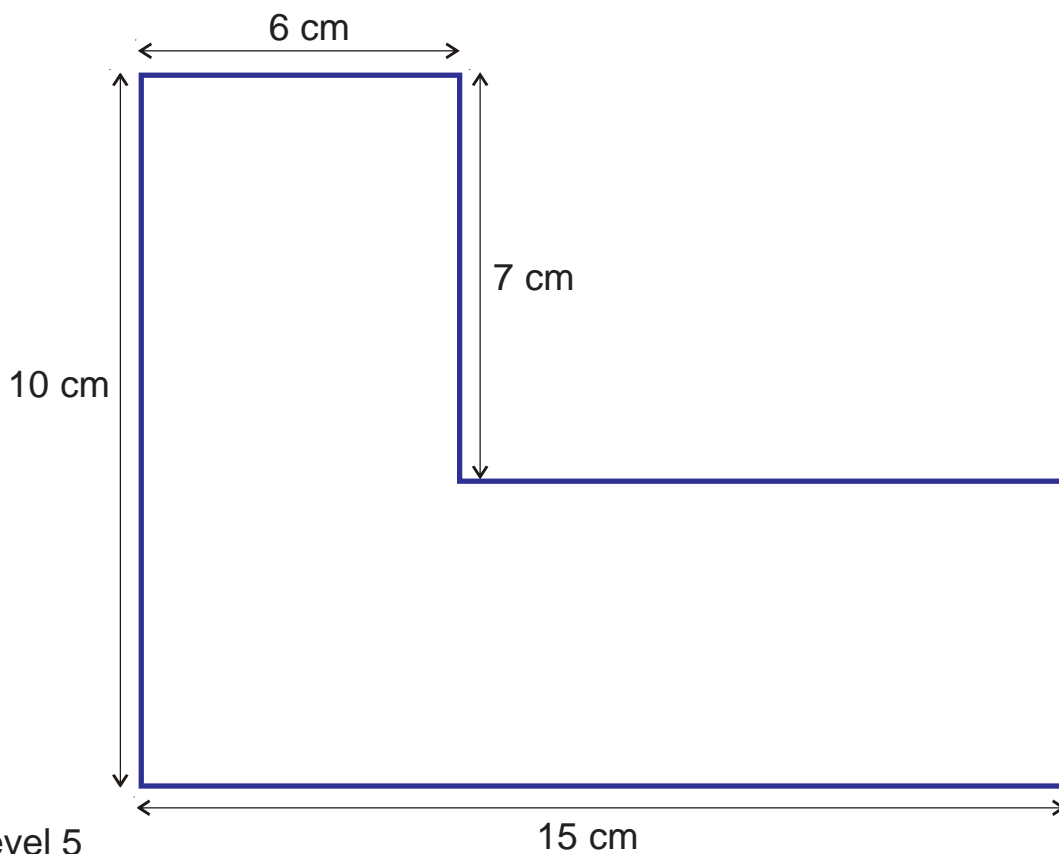
6 cm

7 cm

10 cm

15 cm

Level 5

D6 Probability

1) Estimate a probability (decimal) to go with these:

   a) You will be on time for school on the next
      school day.

   b) It will snow sometime this week.

   c) Your teacher will smile at least once tomorrow.

   d) You will have a disagreement with one of your friends.

   e) England will win the World Cup in 2018.

   f) England or France will win the World Cup in 2018.

2) Work out an exact probability (as a fraction)
   for these events:

   a) If you flip a coin you will get a 'head'.

   b) If you flip two coins you will get two 'heads'.

   c) If you roll a dice you will get a 6.

   d) If you roll two dice you will get two 6's.

   e) If you flip a coin and roll a dice you will get
      a 'head' and a 6.

   f) If you flip three coins you will get three 'heads'.

   g) If you flip three coins you will get two 'heads'
      and a tail in any order.

   h) If you flip three coins you will get at least
      one 'head'.

   i) If you roll two dice and add the scores
      together you will get a total of 4.

Level 5

N13 N14 N15 N16 N17 N18 C14 C15 C16 C17 C18 C19 C20 C21
A3 A4 A5 A6 S13 S14 S15 S16 D6 D7

Player A puts 18 horses on this side
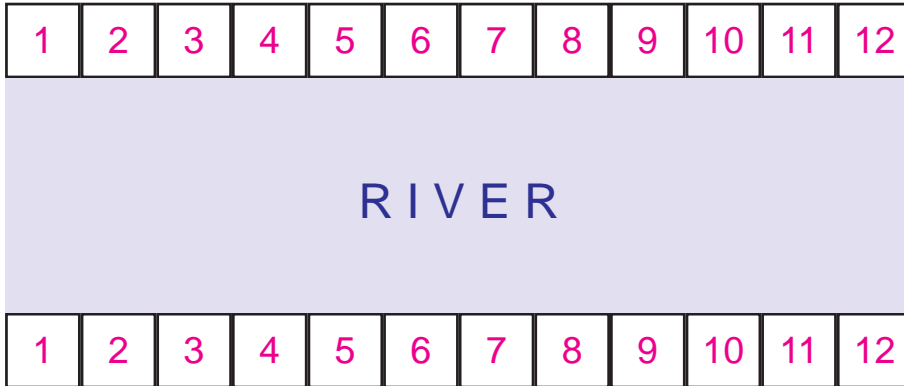
1	2	3	4	5	6	7	8	9	10	11	12

R I V E R

1	2	3	4	5	6	7	8	9	10	11	12

Player B puts 18 horses on this side

To play this game you need the following:

two dice.

18 counters each to represent the 36 horses.

a big copy of the diagram on the left.

Rules of the game:

Each player places their eighteen counters behind any numbers of their choice. (You can see an example below when Sophie and Alex play the game).

Roll the dice and add the scores together.

If any player has a horse behind the total score, he/she can move the horse to the other side.

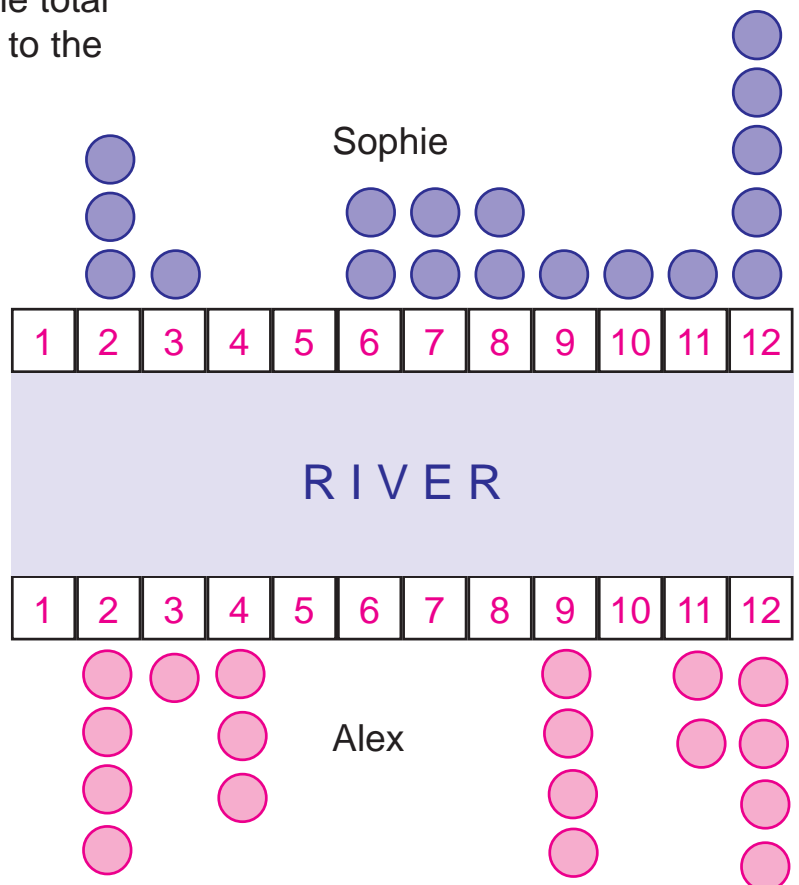Keep rolling the dice and moving the horses whenever you can.

The winner is the first one to get all their horses to the other side.

Tactics matter in this game.

The person who arranges their horses in the best way will usually win.

Play at least 3 times.

Level 5

Sophie

1	2	3	4	5	6	7	8	9	10	11	12

R I V E R

1	2	3	4	5	6	7	8	9	10	11	12

Alex

N13	N14	N15	N16	N17	N18	C14	C15	C16	C17	C18	C19	C20	C21
A3	A4	A5	A6	S13	S14	S15	S16	D6	D7

1) a) Move blocks around so that the heights of the five towers are the same.

   b) What is the mean average number of blocks in each tower?
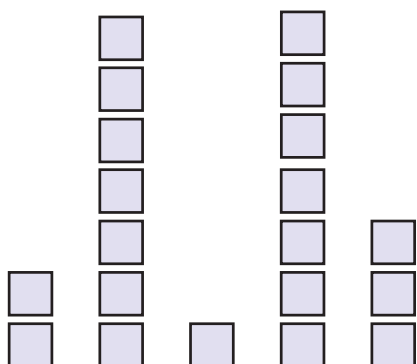
2) a) Move blocks around so that the heights of the five towers are the same (you may have to cut some blocks).

   b) What is the mean average number of blocks in each tower?
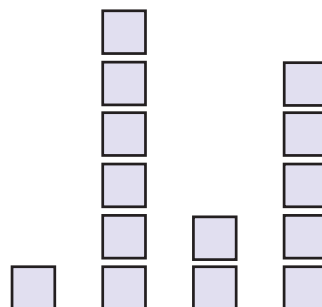
3) In a spelling test, the results for the class (out of 10) are:

   3, 6, 8, 8, 4, 1, 7, 6, 2, 9, 3, 8, 4, 1, 1, 3, 5 and 2

   a) Work out the mean average score for the class.

   b) How many children had a score below the mean average?

4) Two Year 6 classes had a 'times table test' which was marked out of 20.

   The marks in David's class were:

   14, 12, 19, 20, 20, 15, 14, 12, 13, 3, 18, 19, 16, 14, 12, 6

   Harry was in the other class and the marks were:

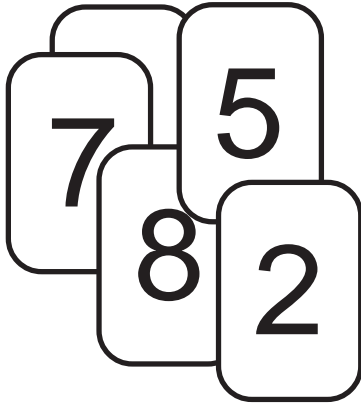   9, 12, 17, 17, 16, 14, 18, 20, 8, 13, 16, 14, 18, 8

   Use the mean average to work out which class did better in the test.
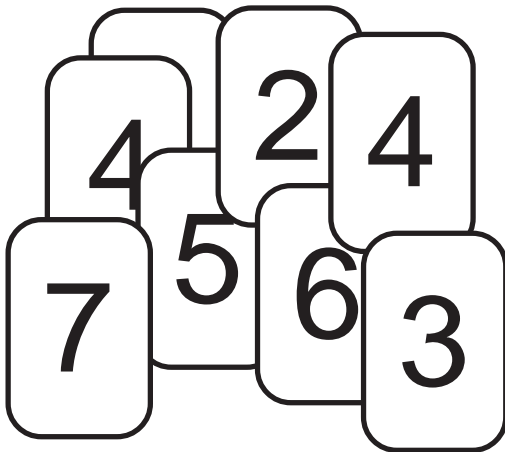
   Level 5

5
7
8
2

1) If the mean average number on these five cards is 6, what is the number on the bottom card?

4
2
4
7
5
6
3

2) If the mean average number on these eight cards is 4.25, what is the number on the bottom card?

3) John rolled a dice thirty times and put the results into this table.

Score	Frequency
1	4
2	3
3	5
4	6
5	4
6	8

Work out his mean average score.

4) What is the mean average number of arms per person in Britain?

5) Can you find out the mean number of children per family in the UK?

Level 5