Key Stage 3 Revision
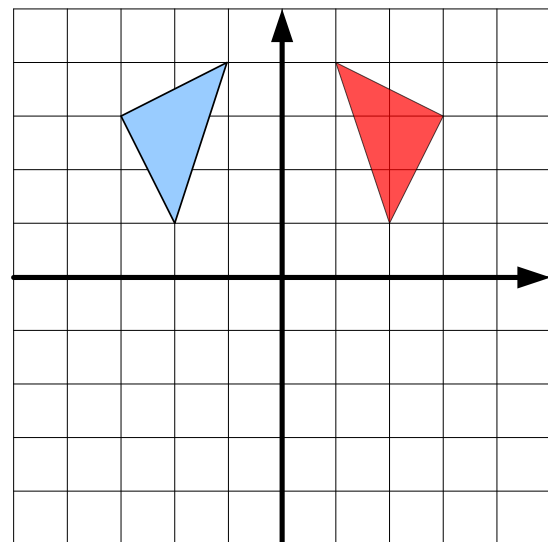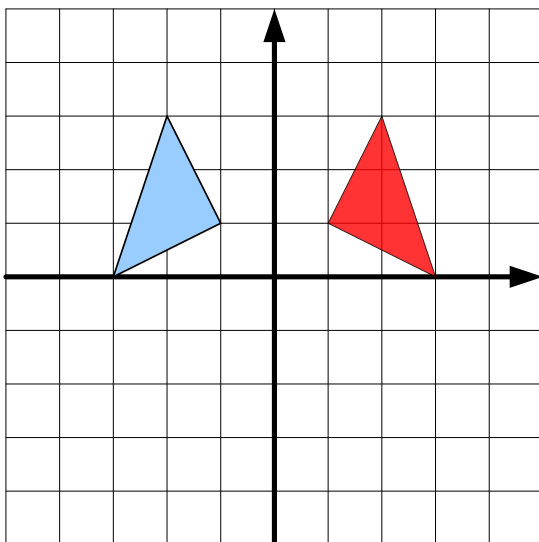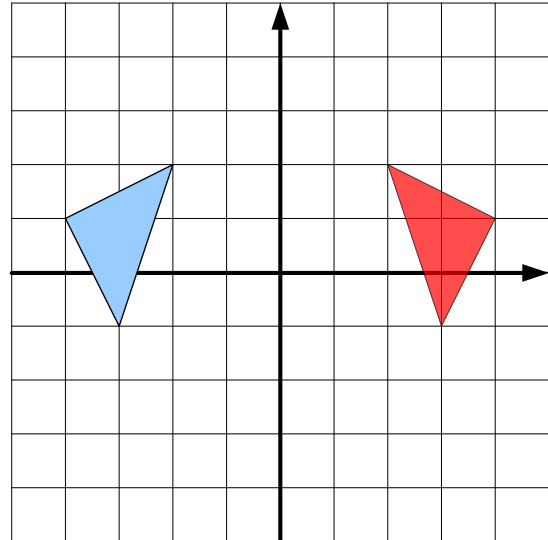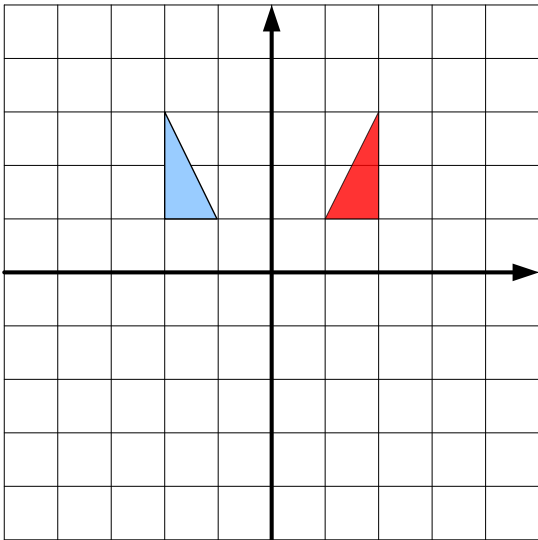
1   **Reflect the shapes in the y axis.**

2   **Below is a list of numbers.**

         15   16   17   18   19   20   21   22   23   24   25

a   List all the prime numbers.

       17   19   23

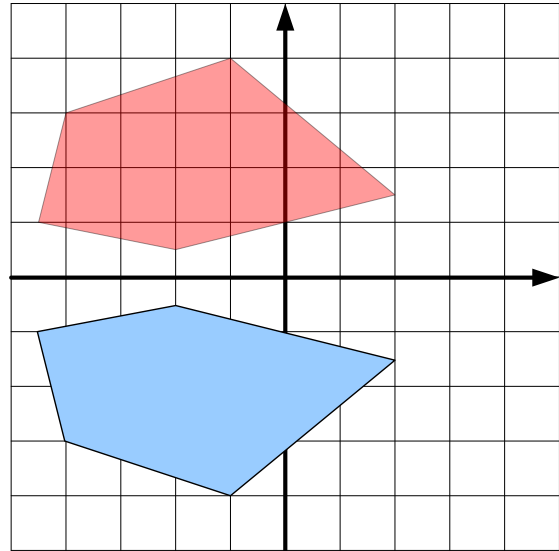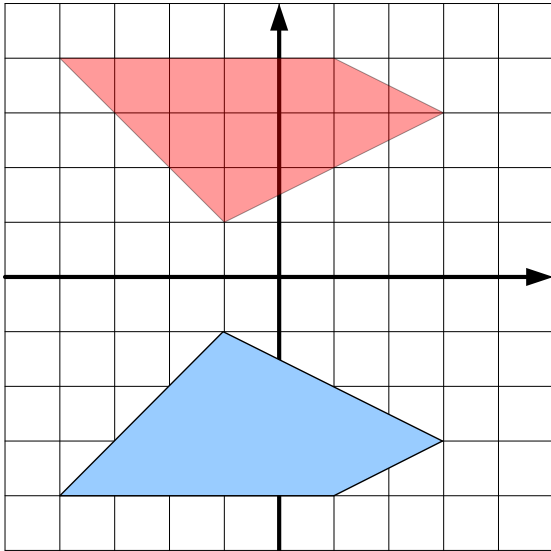b   Write down all the numbers that are multiples of 3.

       15   18   21   24

c   Write down all the factors of 100

       20   25

d   Write down all the square numbers.   16   25

3 **Reflect the following shapes in the x axis:**

4 **Below is a list of numbers.**

2   3   5   6   7   8   9   11   12   15   25

a   List all the prime numbers

2   3   5   7   11

b   Write down all the factors of 24.

2   3   6   8   12

c   Write down all the powers of 5.

5   25

d   Write down all the powers of 2.

$2^1 = 2$ $2^3 = 8$

e   Write down all the cube numbers.

8

f   Write down all the square numbers.

25

g   Write down a perfect number.

6   (28 is the next one up but is not on the list)

h   Write down all the multiples of 3.

3   6   9   12   15

i   Write down all the factors of 36.   2   3   6   12

5   **Round the following numbers to the given degree of accuracy.**

a   67 382 to the nearest hundred.

67,400

b   82 381 to the nearest thousand.

82,000

c   99 983 to the nearest thousand.

100,000

d   839 to one significant figure.

800

e   83.918 to one decimal place.

83.9

f   0.008912 to one significant figure.

0.009

g   724.931 to the nearest ten.

720

h   937, 298 to the nearest ten.

937,300

i   0.392 to the nearest whole one.

0

j   49.928 to the nearest integer.

50 (integer means whole number)

k   9 238 to two significant figures.

9,200

l   0.981 to one significant figure.

1

m   8 to two significant figures.

8.0

n   7.9 to two decimal places.

7.90

o   0.00399319 to two significant figures.   0.0040

6   **Estimate the value of the following:**

a $\dfrac{8.9^2 + 483}{4.525} \approx \dfrac{9^2 + 500}{5} = \dfrac{581}{5} = 160\dfrac{1}{5}$

b $\dfrac{12.7^2 + 837}{9.873} \approx \dfrac{10^2 + 800}{10} = \dfrac{900}{10} = 90$

c $\dfrac{6.7^2 + \sqrt{48}}{6.8013} \approx \dfrac{7^2 + \sqrt{49}}{7} = \dfrac{49 + 7}{7} = \dfrac{56}{7} = 8$

d $\dfrac{4.9^2 + \sqrt{64}}{8.245} \approx \dfrac{5^2 + 8}{8} = \dfrac{33}{8} = 4\dfrac{1}{8}$

e $\dfrac{8.9^2 \times 517}{9.684} \approx \dfrac{9^2 \times 500}{10} = \dfrac{81 \times 500}{10} = \dfrac{40500}{10} = 4{,}050$

7   Billy is b years old. Alex is two years older than Billy. Joanne is twice as old as Alex.

The sum of their ages is 54 years old.

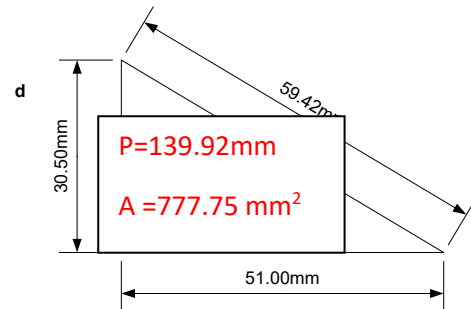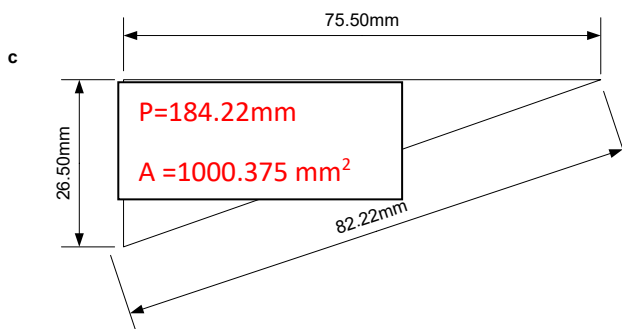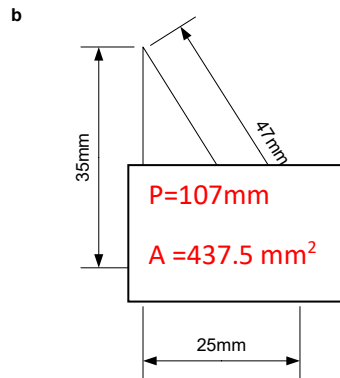a   Form an equation to represent their ages.

$b + b + 2 + 2(b + 2) = 54$

b   How old is each person?

Billy = 12 years old   Alex = 14 years old   Joanne = 28 years old

8   **All the triangles below are right angled triangles.**

Find their perimeter and their area. Make sure you show *how* to work it out.

a

35mm

57mm

45mm

P=137mm

A =787.5 mm^2

b

35mm

47mm

25mm

P=107mm

A =437.5 mm^2

c

75.50mm

26.50mm

82.22mm

P=184.22mm

A =1000.375 mm^2

d

30.50mm

59.42mm

51.00mm

P=139.92mm

A =777.75 mm^2
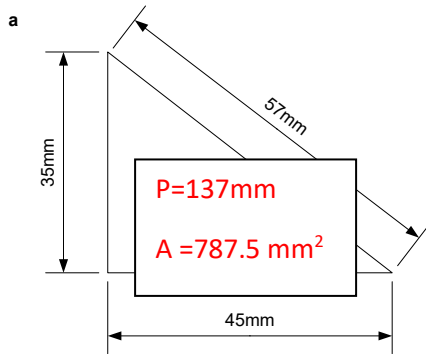
9   Joanne is j years old. Her husband is 5 years older than she is. Her daughter is half the age of her husband. Their total age is 135.

a   Form an equation to show their total ages.

$$j + j + 5 + \frac{j+5}{2} = 135$$

b   How old is each person?

Joanne: 51

Husband: 56

Daughter: 28

c   What is the range of their ages?

56 – 28 = 28 years

10   **Write each of the following numbers in standard form.**

    a   50000

        5×10^4

    b   0.003

        3×10^{-3}

    c   493.903

        4.93903×10^2

    d   0.00205

        2.05×10^{-3}

11   **Write each of the following numbers in ordinary form.**

    a 7×10^4

        70,000

    b 3.0492×10^7

        30,492,000

    c 9.382×10^{-4}

        0.0009382

    d 5.003×10^{-2}

        0.05003

    e 1.2×10^3

        1,200

    f 7×10^{-6}

        0.000007

    g 5.098×10^{-5}

        0.00005098

12   **Find the LCM(32,44) – HCF(32,44)**

        352 – 4 = 348

13 **Two lights are flashing.** One flashes once every 20 seconds while the other flashes once every 18 seconds. They flash together at exactly 9am. At what time do they next flash simultaneously?   9:03 am

Another light flashes every 28 seconds. If all three lights start flashing simultaneously at 11:30 am, what time will then next flash simultaneously?   20m 56s → 11:50:56

14 **Evaluate each of the following. Give your answer in its simplest form where necessary.**

a $\frac{7}{12} \times \frac{20}{21} = \frac{5}{9}$

b $\frac{4}{5} + \frac{11}{20} = \frac{(4\times20)+(5\times11)}{5\times20} = \frac{80+55}{100} = \frac{135}{100} = 1\frac{35}{100} = 1\frac{7}{20}$

c $\frac{9}{10} - \frac{7}{20} = \frac{(9\times20)-(10\times7)}{10\times20} = \frac{180-70}{200} = \frac{110}{200} = \frac{11}{20}$

d $\frac{7}{8} \div \frac{9}{16} = \frac{7}{8} \times \frac{16}{9} = \frac{14}{9} = 1\frac{5}{9}$

e $\frac{11}{23} \times \frac{25}{44} = \frac{1}{23} \times \frac{25}{4} = \frac{25}{92}$

f $\frac{9}{11} + \frac{7}{8} = \frac{(9\times8)+(11\times7)}{11\times8} = \frac{72+77}{88} = \frac{149}{88} = 1\frac{61}{88}$

g $\frac{7}{12} - \frac{4}{9} = \frac{(7\times9)-(12\times4)}{2\times9} = \frac{63-48}{18} = \frac{111}{18} = 6\frac{1}{6}$

h $8 \times \frac{14}{15} = \frac{112}{15} = 7\frac{7}{15}$

i $9 \times \frac{3}{4} = \frac{27}{4} = 6\frac{3}{4}$

j $\frac{7}{9} \div \frac{7}{18} = \frac{7}{9} \times \frac{18}{7} = \frac{1}{1} \times \frac{2}{1} = 2$

15 **Write the following numbers as a product of prime factors.**

a $48 = 2^4 \times 3$ b $54 = 2 \times 3^3$ c $72 = 2^3 \times 3^2$ d $64 = 2^6$

16 **Simplify the expressions leaving your answers in index form.**

a $6^7 \times 6^3 \times 6^4 = 6^{14}$

b $36 \times \frac{6^4}{6} = 6^2 \times \frac{6^4}{6} = 6^2 \times 6^3 = 6^5$

c $4a \times 5a^2 \times 4a^7 = 80a^{10}$

d $\quad \dfrac{g^7 \times g^4}{g^3} = {\color{red}g^7 \times g^4 \times g^{-3} = g^8}$

e $\quad (6^4)^5 = {\color{red}6^{4 \times 5} = 6^{20}}$

f $\quad \left(\dfrac{2}{3}\right)^3 = {\color{red}\dfrac{2 \times 2 \times 2}{3 \times 3 \times 3} = \dfrac{8}{27}}$

g $\quad 36^4 \times 6^3 \times 216^{-5} = {\color{red}(6^2)^4 \times (6)^3 \times (6^3)^{-5} = 6^{-4}}$

17 **Evaluate each of the following**

a $\quad 5^3 = {\color{red}125}$

b $\quad \sqrt{81} \times \left(\dfrac{1}{3}\right)^2 = {\color{red}1}$

c $\quad 10^4 = {\color{red}10{,}000}$

d $\quad \sqrt{64} + \sqrt{49} + \sqrt{225} + \sqrt{196} = {\color{red}8 + 7 + 15 + 14 = 44}$

18 **Simplify each expression below**

a $\quad k + k + k + k + k + k = {\color{red}6k}$

b $\quad 3 \times e \times f \times 2 = {\color{red}6ef}$

c $\quad 2 \times w \times w \times w = {\color{red}2w^3}$

19 **Give your answer in standard form**

a
$$\frac{8 \times 10^2 \times 5 \times 10^3}{4 \times 10^{-2}} = \frac{8 \times 5}{4} \times \frac{10^2 \times 10^3}{10^{-2}} = \frac{40}{4} \times 10^7 = 1 \times 10^8$$

b
$$\frac{9 \times 10^8 \times 8 \times 10^7}{6 \times 10^5} = 1.2 \times 10^{11}$$

c
$$\frac{12 \times 10^3 \times 8.6 \times 10^5}{2.4 \times 10^3} = 4.3 \times 10^6$$

20 **Work out the upper and lower bounds of the following and write the error interval**

a   7.9 mm (rounded to 1 decimal place)

$7.85 \leq length < 7.95$

b   30 miles (rounded to one significant figure)

$29.5 \leq length < 30.5$

c   0.83 kg (rounded to 2 significant figures)

$0.825 \leq mass < .835$

d   0.083 m (rounded to 2 significant figures)

$0.0825 \leq length < 0.0835$

e   9.6 m (rounded to one decimal place)

$9.55 \leq length < 9.65$

21 **Expand and simplify**

a $6(x + 3) + 7(3x - 9) - 5(3x - 12) = 12x + 15$

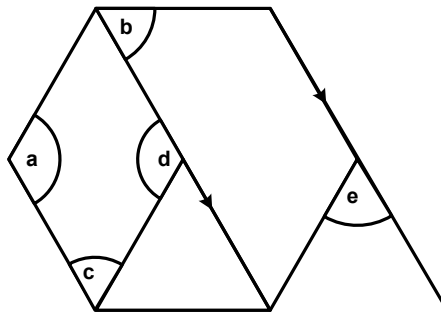b $7(3x + 5) + 4(x - 2) - 4(2x - 1) = 17x + 31$

c $8(5x + 17) + 5(6x - 7) - 3(8x - 4) + 13(4x - 2) = 98x + 87$

22   For the following equation, what is the lowest value of x that yields a positive result?

$5(4x + 12) - 7(8 - 3x) + 5(4x - 24) + 9(8 - 11x) < 0$ $x < -1\frac{3}{19}$

23   a   Find the size of the angles shown below. The regular hexagon and the equilateral triangle have edges that are the same length.

a=120   b=60   c=60   d=120   e=60

b   What other shapes have been formed? rhombus and trapezium

24 **The menu** below will make enough soup to feed 6 people. What amount of each ingredient would you need to feed 15 people?

Pistou Soup (to feed 6 people)

150 g thick cut bacon

200g of fresh white haricot beans

100g of fresh red haricot beans

250g of sliced flat green beans

2 medium floury diced potatoes

3 tomatoes skinned, seeds removed and chopped

4 medium courgettes chopped

salt and freshly ground black pepper (to taste)

100g small macaroni

FOR THE PISTOU

3 garlic cloves, smashed and peeled

course sea salt to taste

30g of fresh basil leaves

2 small tomatoes, skinned, seeds removed and chopped

freshly ground black pepper

25g grated mimolette cheese

3 tablespoons of olive oil

Pistou Soup (to feed 15 people)

__375g___ thick cut bacon

_500g_ of fresh white haricot beans

_250g__ of fresh red haricot beans

_625g__ of sliced flat green beans

_5 medium floury diced potatoes

__7.5_ tomatoes skinned, seeds removed and chopped

_10_medium courgettes chopped

salt and freshly ground black pepper (to taste)

_250g_ small macaroni

FOR THE PISTOU

7.5 garlic cloves, smashed and peeled

course sea salt to taste

75g of fresh basil leaves

5 small tomatoes, skinned, seeds removed and chopped

freshly ground black pepper

62g_ grated mimolette cheese

7.5 tablespoons of olive oil

25 **Solve each of the following**

a $3x + 8 = 5x - 7$

x=7.5

b $9x + 8 = 5x + 32$

x=6

c $5x - 12 = 3x + 5$

x=8.5

d $7x - 35 = x + 7$

x=7

26 **The heights** of Abbie, Billy and Charlie are in the ratio 6:7:9. Charlie is 180 cm tall. How tall are the other two people?

Abbie is 120cm. Billy is 140cm

27 **Joe is taking a trip to Singapore.** He wants to convert £1250 into Singaporean dollars.

The current exchange rate is £1 = $1.95.

a How many dollars will Joe get?

2437.50 Sing$

b On his return, Joe has $260 remaining. He changes it back into pounds. How much does he get?

£133.33 rounded to the nearest penny