Week 1

1. Simplify

a. $3x + 6x - 5x = 4x$

b. $y + y + y + y = 4y$

c. $4x + 3y + 2x - y = 6x + 2y$

d. $6a - 5b - a + 2b = 5a - 3b$

2. Expand

a. $3(2x + 5) = 6x + 15$

b. $x(x - 5) = x^2 - 5x$

c. $6(x + y) = 6x + 6y$

d. $3x(x - 2y) = 3x^2 - 6xy$

3. Expand and Simplify

a. $3(x + 4) + 5(2x - 3)$
$3x + 12 + 10x - 15$
$13x - 3$

b. $4(x - 1) - 3(x + 2)$
$4x - 4 - 3x - 6$
$x - 10$

4. Expand and Simplify

a. $(x + 5)(x + 6)$
$x^2 + 6x + 5x + 30$
$x^2 + 11x + 30$

b. $(x - 7)(x + 3)$
$x^2 + 3x - 7x - 21$
$x^2 - 4x - 21$

c. $(x - 5)(x - 6)$
$x^2 - 6x - 6x + 30$
$x^2 - 11x + 30$

d. $(2x - 3)(x + 5)$
$2x^2 + 10x - 3x - 15$
$2x^2 + 7x - 15$

5. Factorise

a. $10x - 12$
$2(5x - 6)$

b. $x^2 + 8x$
$x(x + 8)$

c. $x^2 + 9x + 20$
$(x + 4)(x + 5)$

d. $x^2 - 16$
$(x + 4)(x - 4)$

6. Solve

a. $3x + 9 = 12$
$-9 \quad -9$
$3x = 3$
$x = 1$

b. $4x + 3 = 2x + 14$
$2x = 11 \quad x = 5.5$

7. Simplify

a. $x^7 \div x^3 = x^4$

b. $4s^2t \times 3s^5t^3 =$
$12s^7t^4$

c. $(y^5)^3$
$y^5 \times y^5 \times y^5 = y^{15}$

8. Nth Term

a. Find the Nth Term of

3 8 13 18

$5n - 2$

b. Is 598 in the sequence?

$5n - 2 = 598$
$5n = 600$
$N = 120$ so Yes.

9. Inequalities

a. Solve $3x + 7 < 13$

$3x < 6$

$X < 2$

b. Represent $-3 < x \leq 2$ on a number line.

10. Units

Fill in the blanks

3.1 cm = 31mm

4500g = 4.5kg

3.1 litres = 3100ml

0.75km = 750 m

11. Factors and Multiples

a. Write down the factors of 20. 1,20, 2, 10, 4, 5

b. Write down the first 5 multiples of 12. 12, 24, 36, 48, 60

c. Work out the Highest Common Factor of 20 and 30. 10

d. Work out the Lowest Common Multiple of 20 and 30. 60

12. Primes

a. Write down the first 5 prime numbers.

2, 3, 5, 7, 11

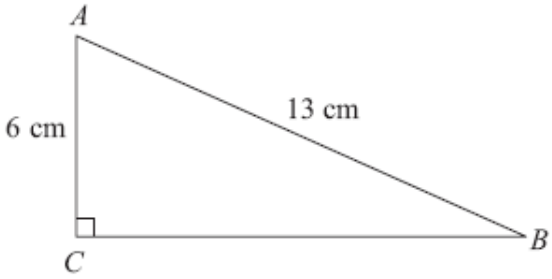
b. Write 200 as a product of prime factors.

$2 \times 2 \times 2 \times 5 \times 5 = 2^3 \times 5^2$

13. Pythagoras

Work out the length of *BC*.

Give your answer correct to 3 significant figures.



$13^2 - 6^2 = 133$ $\sqrt{133} = 11.5cm$

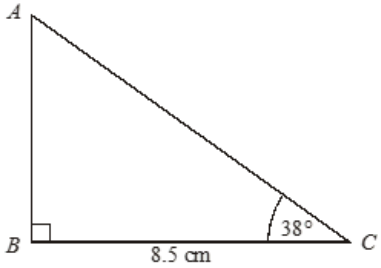
..... cm

14. Trigonometry

Work out the length of *AB*.

Give your answer correct to 3 significant figures.

Tan(38) x 8.5 = 6.64cm



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15. Speed

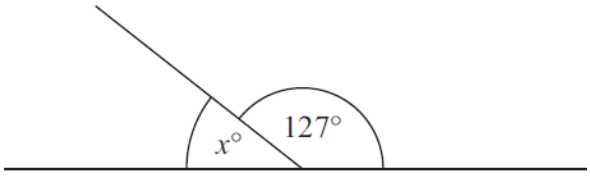
A sprinter runs a distance of 200 metres in 25 seconds.

Work out the average speed of the sprinter.

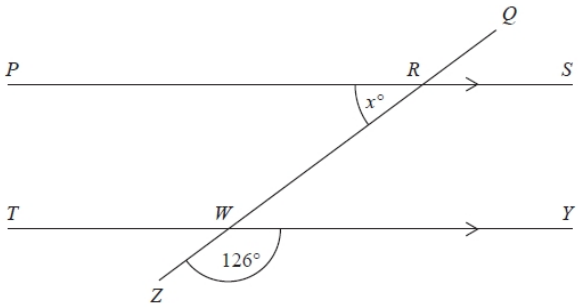
$S = \frac{d}{t} = \frac{200}{25} = 8m/s$

16. Angle Facts.

Find x. Give all reasons.



X = 180 – 127 = 53
Angles on a straight line add up to 180



YWR = 54 Angles on a straight line add up to 180
X = 54 because alternate angles are equal.

17. Ratio

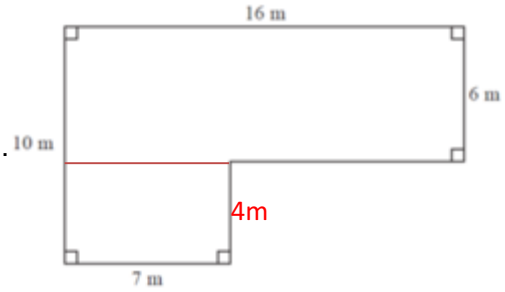
a. Share £60 in the ratio 3:2.

60/5 = 12 3 x 12: 2x 12 36:24

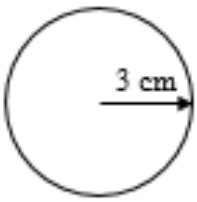
b. The ratio of the number of boys to the number of girls in a class is 2:3.
There are 24 girls in the class. 3 parts = 24
How many boys are there? 1 part = 8 2 parts boys = 16

18. Area

Calculate the area.



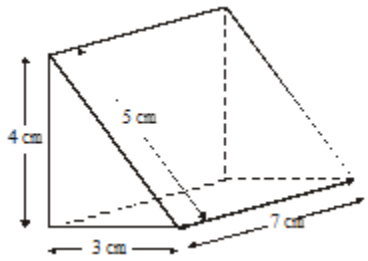
16 x 6 = 96
4 x 7 = 28
96 + 28 = 124m^2



Π x 3^2 = 28.3cm^2

19. Volume.

Calculate the volume of this triangular prism.



Vol = area of Front face x length
Area = (4x3)/2 = 6
Vol = 6 x 7 = 42cm^2

20. Proportion

a. 3 cakes cost £1.77.
How much would 5 cost?

1 cake = 0.59
5 x 0.59 = £2.95

£1 = $1.23,

b. Convert £80 to dollars.

80 x 1.23 = $98.40

c. Convert $300 to pounds.

300 ÷ 1.23 = £243.90

21. Averages.

13 7 6 6

Calculate the:

a. Mode Mode = 6
b. Range Range = 13 – 6 = 9

d. Mean

22. Four Functions

a. 200 – 78 b. 452 ÷ 4 c. 1.23 x 2.7

122 113 Grid 3.321

23. **Fractions**. Calculate

a. $\frac{3}{4}+\frac{1}{5}$ b. $\frac{3}{4}$ x $\frac{1}{5}$ c. $2\frac{3}{4}+1\frac{1}{5}$ d. $1\frac{3}{4}\div\frac{4}{5}$

$\frac{15}{20}+\frac{4}{20}$

$\frac{19}{20}$

$\frac{3x1}{4x5}$

$\frac{3}{20}$

$\frac{11}{4}+\frac{6}{5}$

$\frac{55}{20}+\frac{24}{20}$

$\frac{79}{20}=3\frac{19}{20}$

$\frac{7}{4}\div\frac{4}{5}$

$\frac{7}{4}\times\frac{5}{4}$

$\frac{7x5}{4x4}=\frac{35}{16}=2\frac{3}{16}$

24. Estimate

$$\frac{5.79\times312}{0.523}$$

$\frac{6\,x\,300}{0.5}=\frac{1800}{0.5}=3600$

25. Percentages

a. Calculate 15% of 120

10% = 12 5% = 6 15% = 18

b. Increase £80 by 30%

10% = 8 30% = 24 80 + 24 = £104

26. FDP

a. Write 20% as a fraction in its simplest form. $\frac{20}{100}=\frac{1}{5}$

b. Write 0.15 as a percentage. 15%

27. Decimals

Write the following decimals in order from smallest to s largest.

0.34 0.4 0.304 0.304 0.34 0.4

28. **Probability**

a. I roll a normal dice. What is the probability I get a 4? $\frac{1}{6}$

Pupils are asked about their favourite food.

b. Find the probability of a pupil choosing pasta.

Snack	burger	pizza	pasta	salad
Probability	0.35	0.15		0.2

0.35 + 0.15 + 0.2 = 0.7

1 – 0.7 = 0.3

c. 200 pupils were asked Calculate how many said salad.

0.2 x 200 or 20% of 200 = 40