

Week 2

1. Simplify

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

$6x$

b. $y + y + y$

$3y$

c. $5x + 2y + 5x - 2y$

$10x$

d. $8a - 5b - 5a + 4b$

$3a - b$

2. Expand

a. $5(2x - 1)$

$10x - 5$

b. $x(x + 6)$

$x^2 + 6x$

c. $5(x + 3)$

$5x + 15$

d. $2x(x - y)$

$2x^2 - 2xy$

3. Expand and Simplify

a. $4(2x + 4) + 3(x - 3)$

$8x + 16 + 3x - 9$

$11x + 7$

b. $5(x - 2) - 2(x + 3)$

$5x - 10 - 2x - 6$

$3x - 16$

4. Expand and Simplify

a. $(x + 2)(x + 7)$

$x^2 + 2x + 7x + 14$

$x^2 + 9x + 14$

c. $(x - 3)(x - 8)$

$x^2 - 3x - 8x + 24$

$x^2 - 11x + 24$

b. $(x - 5)(x + 2)$

$x^2 - 5x + 2x - 10$

$x^2 - 3x - 10$

d. $(3x + 1)(x - 4)$

$3x^2 + x - 12x - 4$

$3x^2 - 11x - 4$

5. Factorise

a. $20x + 16$

$4(5x + 4)$

c. $x^2 - 12x + 20$

$(x - 10)(x - 2)$

b. $x^2 - 6x$

$x(x - 6)$

d. $x^2 - 25$

$(x + 5)(x - 5)$

6. Solve

a. $2x + 10 = 14$

$2x = 4$

$x = 2$

b. $5x - 2 = 2x + 16$

$3x = 18$ so $x = 6$

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^{15}

8. Nth Term

a. Find the Nth Term of

5 8 11 14

$3n + 2$

b. Is 301 in the sequence?

$3n + 2 = 301$

$3n = 299$

$n = 99.7$ so not in sequence

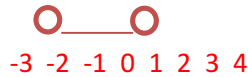
9. Inequalities

a. Solve $4x + 2 > 17$

$$4x > 15$$

$$x > 15/4 \text{ or } 3.75$$

b. Represent $-2 < x < 1$ on a number line.



10. Units

Fill in the blanks

$$7.2 \text{ cm} = 72 \text{ mm}$$

$$12000\text{g} = 12 \text{ kg}$$

$$3.2 \text{ litres} = 3200 \text{ ml}$$

$$0.431\text{km} = 431 \text{ m}$$

11. Factors and Multiples

a. Write down the factors of 16. 1, 2, 4, 8, 16

b. Write down the first 5 multiples of 11. 11, 22, 33, 44, 55

c. Work out the Highest Common Factor of 18 and 24. 6

d. Work out the Lowest Common Multiple of 12 and 20. 60

12. Primes

a. Write down the first 5 prime numbers. 2, 3, 5, 7, 11

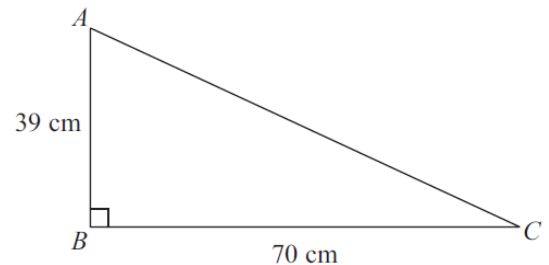
b. Write 80 as a product of prime factors. $2 \times 2 \times 2 \times 2 \times 5 = 2^4 \times 5$

13. Pythagoras

Work out the length of AC.

Give your answer correct to 3 significant figures.

$$39^2 + 70^2 = 6421 \quad \sqrt{6421} = 80.1\text{cm}$$



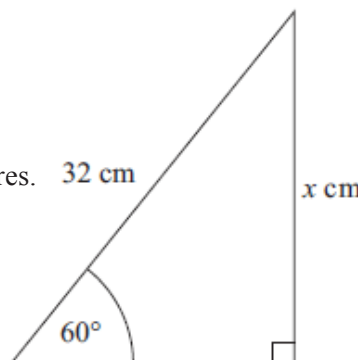
..... cm

14. Trigonometry

Work out the length x.

Give your answer correct to 3 significant figures. 32 cm

$$32 \times \sin(60) = 27.7\text{cm}$$



..... cm

15. Speed

The distance from Liverpool to Prague is 1200 km.

A plane travels at an average speed of 480km/h.

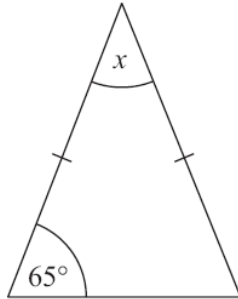
Work out the time it takes to complete the journey.

$$1200 / 480 = 2.5 \text{ hours}$$

.....hrs

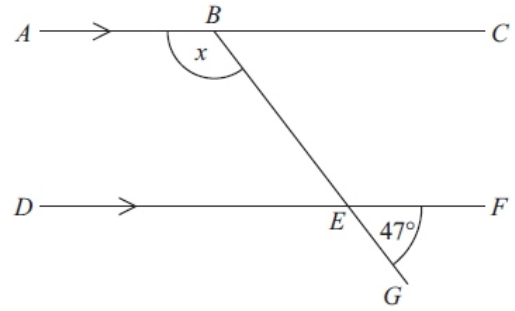
16. Angle Facts.

Find x . Give all reasons.



$$x = 50$$

2 angles in an isosceles triangle are equal
Angles in a triangle add up to 180.



$$x = 133$$

Angle CBE = 47 (corresponding angles =)
Angles on a straight line = 180

17. Ratio

a. Share £80 in the ratio 7:3.

$$7 + 3 = 10$$

$$80 / 10 = 8$$

$$7 \times 8 = 56, 3 \times 8 = 24 \text{ so}$$

$$\underline{56 : 24}$$

b. The ratio of the number of boys to the number of girls in a school is 4:5.

There are 135 girls in the school.

What's the total number of pupils in the school.

B : G

4 : 5

? : 135

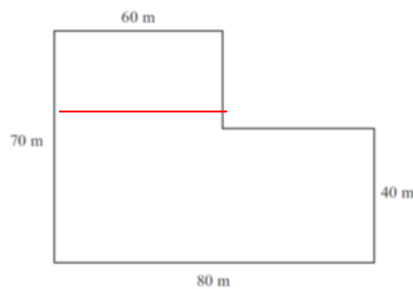
so multiplier is 27

4 x 27 = 108 boys so total is

$$108 + 135 = 243$$

18. Area

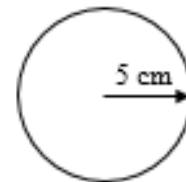
Calculate the area.



$$\text{Top} = 60 \times 30 = 1800$$

$$\text{Bottom} = 80 \times 40 = 3200$$

$$\text{TOTAL} = 5000\text{m}^2$$



$$A = \pi \times r^2$$

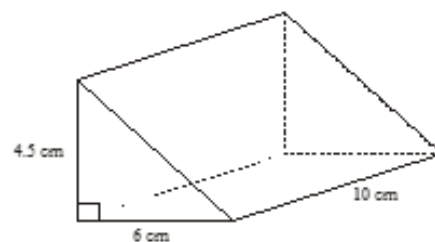
$$= \pi \times 25$$

$$= 78.5\text{cm}^2$$

19. Volume.

Calculate the volume of this triangular prism.

$$\frac{4.5 \times 6}{2} \times 10 = 135\text{cm}^3$$



20. Proportion

a. 5 cakes cost £2.65.

How much would 7 cost?

$$2.65 / 5 \times 7 = \text{£}3.71$$

£1 = \$1.18,

b. Convert £60 to dollars. $60 \times 1.18 = \$70.80$

c. Convert \$240 to pounds. $240 / 1.18 = £203.39$

21. Averages.

8 5 7 7 3

Calculate the:

- a. Mode 7
- b. Range $8 - 3 = 5$
- c. Median 7
- d. Mean $30 / 5 = 6$



22. Four Functions

a. $300 - 64$
 236

b. $366 \div 3$
 122

c. 1.3×4.6
 5.98

23. Fractions. Calculate

a. $\frac{1}{3} + \frac{5}{9}$
 $\frac{3}{9} + \frac{5}{9} = \frac{8}{9}$

b. $\frac{4}{5} \times \frac{1}{2}$
 $\frac{4}{5} \times \frac{1}{2} = \frac{4}{10}$

c. $2\frac{1}{4} - 1\frac{2}{3}$
 $\frac{9}{4} - \frac{5}{3} = \frac{27}{12} - \frac{20}{12} = \frac{7}{12}$

d. $2\frac{1}{4} \div 1\frac{2}{3}$
 $\frac{9}{4} \times \frac{3}{5} = \frac{27}{20}$

24. Estimate

$$\frac{4.1 \times 21}{0.48} = \frac{4 \times 20}{0.5} = 160$$

25. Percentages

a. Calculate 40% of 80
 $8 \times 4 = 32$

b. Increase £40 by 15%
 $15\% = 6$
so new = £46

26. FDP

a. Write 24% as a fraction in its simplest form. $24/100 = 6/25$

b. Write 0.7 as a fraction. $7/10$

27. Decimals

Write the following decimals in order from smallest to largest.

0.354 0.360 0.300

$0.3, 0.354, 0.36$

28. Probability

a. I roll a normal dice. What is the probability I get a 6? $1/6$
Pupils are asked about their favourite colour.

b. Find the probability of a pupil liking green.

Colour	Red	Blue	Green	Black
Probability	0.3	0.17		0.24

$$0.3 + 0.17 + 0.24 = 0.71$$

$$1 - 0.71 = 0.29$$

c. 300 pupils were asked. How many said red?

$$0.3 \times 300 = 90$$