

Week 5

1. Simplify

a. $6y + 2y - 8y = 0$

b. $a - a + a + a - a = a$

c. $6x + 2y + 5x - 5y = 11x - 3y$

d. $5a - 3b - 4a - b = a - 4b$

2. Expand

a. $4(2x - 1) = 8x - 4$

b. $a(a + b) = a^2 + ab$

c. $5(x - 3) = 5x - 15$

d. $2xy(4x - 3y) = 2x^2y - 6xy^2$

3. Expand and Simplify

a. $5(2x - 1) + 4(x + 3)$
 $10x - 5 + 4x + 12$
 $14x + 7$

b. $4(2x - 5) - 2(x + 3)$
 $8x - 20 - 2x - 6$
 $6x - 26$

4. Expand and Simplify

a. $(x + 8)(x + 3)$
 $x^2 + 3x + 8x + 24$
 $x^2 + 11x + 24$

b. $(x + 7)(x - 5)$
 $x^2 - 5x + 7x - 35$
 $x^2 + 2x - 35$

c. $(x - 3)(x - 2)$
 $x^2 - 3x - 2x + 6$
 $x^2 - 5x + 6$

d. $(3x - 5)(2x + 4)$
 $6x^2 + 12x - 10x - 20$
 $6x^2 + 2x - 20$

5. Factorise

a. $4p - 14$
 $2(2p - 7)$

b. $2y^2 - 6y$
 $2y(y + 3)$

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

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

6. Solve

a. $2x - 10 = 4$
 $+ 10 \quad + 10$
 $2x = 14$
 $x = 7$

b. $4x - 2 = 8 - x$
 $+x \quad +x$
 $5x - 2 = 8$
 $5x = 10$
 $x = 2$

7. Simplify

a. $a^5 \times a^2 = a^7$

b. Find n. $3^n \times 9 = 3^5$
 $9 = 3^2$
 $N = 3$

c. $(2y^5)^3$
 $2y^5 \times 2y^5 \times 2y^5 = 8y^{15}$

8. Nth Term

a. Find the Nth Term of

3 7 11 15
 $4n - 1$

b. Is 48 in the sequence?

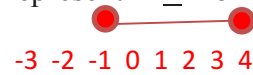
$4n - 1 = 48$
 $4n = 49$

9. Inequalities

a. Solve $5x + 8 > x$

$$\begin{aligned} -x & \quad -x \\ 4x + 8 & > 0 \\ 4x & > -8 \\ x & > -2 \end{aligned}$$

b. Represent $x \leq 1$ on a number line.



10. Units

Fill in the blanks

7.2 m = **720**cm

1.5 hours = **90** minutes

65 ml = **0.065** litres

0.041 km = **41** m

11. Factors and Multiples

a. Write down the factors of 44. **1, 44, 2, 22, 4, 11**

b. Write down the first 5 multiples of 30. **30, 60, 90, 120, 150**

c. Work out the Highest Common Factor of 20 and 25.

1, 20, 2, 10, 4, 5 1, 25, 5 5

d. Work out the Lowest Common Multiple of 8 and 36.

8, 16, ... 64, 72 36, 72 = 72

12. Primes

a. Is 1 a prime number? Explain your answer..

No. It only has 1 factor.

b. Write 240 as a product of prime factors.

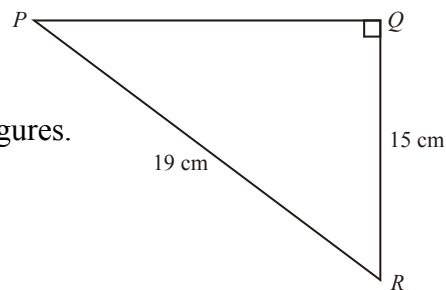
$2 \times 2 \times 2 \times 2 \times 3 \times 5 = 2^3 \times 3 \times 5$

13. Pythagoras

Work out the length of YZ.

Give your answer correct to 3 significant figures.

$19^2 - 15^2 = 136 \quad \sqrt{136} = 11.7 \text{ cm}$



..... cm

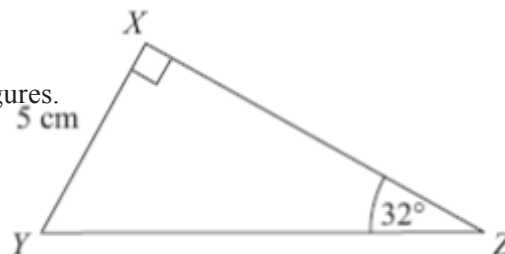
14. Trigonometry

Work out the length x.

Give your answer correct to 3 significant figures.

$XZ = 5 \div \tan 32 = 8.00 \text{ cm}$

$YZ = 5 \div \sin 32 = 15.1 \text{ cm}$



..... cm

15. Speed

The London airport is 200 miles from Manchester airport.

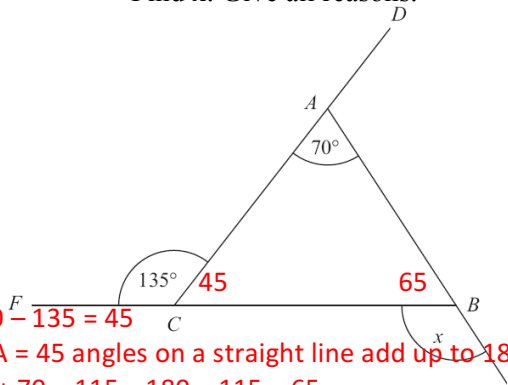
A plane leaves Manchester airport at 10 am to fly to the London airport.

The plane flies at an average speed of 120 mph. What time does the plane arrive at the

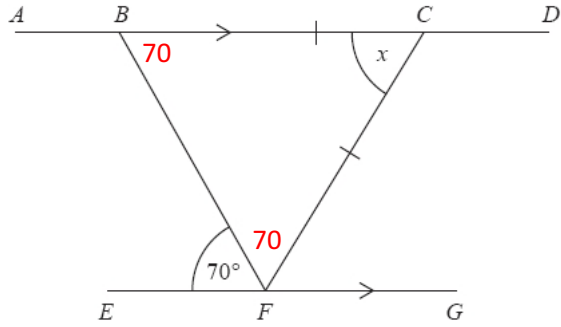
London airport? $S = \frac{d}{t} \quad T = \frac{d}{s} = \frac{200}{120} = 1.66 \dots \quad 1.66 \dots \times 60 = 100 \text{ minutes}$

16. Angle Facts.

Find x . Give all reasons.



$180 - 135 = 45$
 $BCA = 45$ angles on a straight line add up to 180
 $45 + 70 = 115$ $180 - 115 = 65$
 $CBA = 65$ angles in a triangle add up to 180
 $X = 180 - 65 = 115$ angles on a straight line add up to 180



$FBC = 70$ alternate angles are equal
 $BFC = 70$ base angles in an isosceles triangle are equal
 $70 + 70 = 140$ $180 - 140 = 40$
 $X = 40$ angles in a triangle add up to 180

17. Ratio

a. David and Michael share £360 in the ratio 5:4.
 How much more does David get?

$5 + 4 = 9$
 $360 \div 9 = 40$
 $5 \times 40 : 4 \times 40$
 $200 : 160$ David gets £40 more

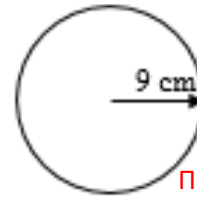
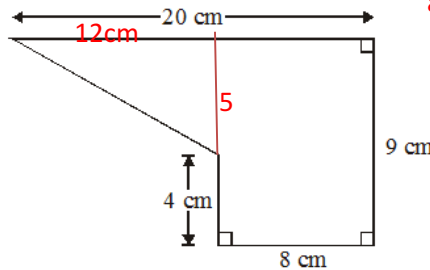
b. The ratio of the number of boys to the number of girls in a school is 3:5.
 There are 64 more girls in the school than boys.
 What's the total number of pupils in the school.

64 more ... 2 parts = 64
 1 part = 32
 8 parts in total = $8 \times 32 = 256$

18. Area

Calculate the area

$(12 \times 5) \div 2 = 30$
 $8 \times 9 = 72$
 $30 + 72 = 102 \text{ cm}^2$

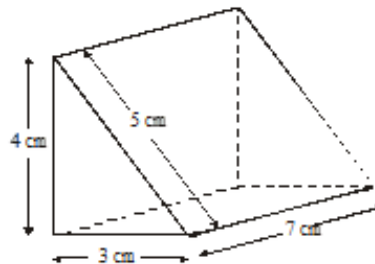


$\pi \times 9^2 = 254.5 \text{ cm}^2$

19. Surface Area.

Calculate the surface area of this triangular prism.

Front/back = $(4 \times 3) \div 2 = 6$
 Front/back = $(4 \times 3) \div 2 = 6$
 Bottom = $3 \times 7 = 21$
 Left = $4 \times 7 = 28$
 Slope = $5 \times 7 = 35$ Total = 96 cm^2



20. Proportion

a. 4 cakes cost £12.
 How much would 6 cost?

2 cakes = 6
 $6 \times 12 = £18$

b. £1 = \$1.24,
 Convert £50 to dollars.

$50 \times 1.24 = \$62$

c. Convert \$200 to pounds.

$200 \div 1.24 = £161.29$

21. Averages.

Ed has 4 cards. There is a number on each card.
 The mean of the 4 numbers on Ed's cards is 10.

Work out the number on the 4th card. $4 \times 10 = 40$ $12 + 6 + 15 = 33$ $40 - 33 = 7$

12

6

15

?



22. Four Functions

a. $8.2 - 0.49$

7.71

b. $496 \div 8$

62

c. 1.29×1.8

2.322

23. Fractions. Calculate

a. $\frac{2}{3} + \frac{5}{6}$

$\frac{4}{6} + \frac{5}{6}$
 $\frac{9}{6} = \frac{3}{2} = 1\frac{1}{2}$

b. $\frac{3}{7} \times \frac{5}{6}$

$\frac{3 \times 5}{7 \times 6}$
 $\frac{15}{42} = \frac{5}{14}$

c. $3\frac{3}{4} - 1\frac{1}{2}$

$\frac{11}{4} - \frac{3}{2}$
 $\frac{11}{4} - \frac{6}{4}$
 $\frac{5}{4} = 1\frac{1}{4}$

d. $3\frac{3}{4} \div 1\frac{1}{5}$

$\frac{11}{4} \div \frac{6}{5}$
 $\frac{11}{4} \times \frac{5}{6}$
 $\frac{11 \times 5}{4 \times 6} = \frac{55}{24} = 2\frac{7}{24}$

24. A theatre has 31 rows, with 17 seats in each row. Tickets cost £18.50 each. The theatre sells out. **Estimate** how much money is made through ticket sales.

$30 \times 20 = 600$ seats

$20 \times 600 = \text{£}12000$

25. Percentages

- a. Calculate 7% of 300

$1\% = 3$ $7\% = 21$

- b. Increase £120 by 7.5%

$10\% = 12$ $5\% = 6$ $2.5\% = 3$

$7.5\% = \text{£}9$

$120 + 9 = \text{£}129$

26. FDP

- a. Write 76% as a decimal. = 0.76

- b. Write $\frac{13}{20}$ as a decimal. $\frac{13}{20} = \frac{65}{100} = 0.65$

27. FDP

Write the following in order from smallest to largest.

0.24

$19\% = 0.19$

$\frac{1}{5} = \frac{2}{10} = 0.2$

$19\%, \frac{1}{5}, 0.24$

28. Probability

- a. I roll a normal dice. What is the probability I get a number greater than 4? $\frac{2}{6} = \frac{1}{3}$
- b. Pupils are asked about their favourite food. 40 pupils were asked. How many said pasta?

Snack	burger	pizza	pasta
Probability	0.35	0.15	

$0.35 + 0.15 = 0.5$

$1 - 0.5 = 0.5$

$40 \times 0.5 = 20$