

Monifieth High School
Mathematics Department

CfE Level 3

Revision for Exam (May of S1)

Revision of Whole Numbers

Remember to lay out the calculations carefully. Put in the column headings if they help. Also remember about the 'carry digit' when you are calculating answers, especially adding or multiplying

Rounding – when rounding to the nearest 10, 100 or 1000, think about which value your number is closer to: is 47 closer to 40 or closer to 50?

It is closer to 50.



When the number is exactly in the middle, then we round up: 550 rounds up to 600 (to the nearest 100)

Estimating

It is useful to have some idea of the answer to a calculation before you start. For example, $789 + 812$ is roughly $800 + 800$ so the answer should be about 1600. Buying four items at £7.99 will cost approximately $4 \times £8 = £32$.

Powers and Indices

Square Numbers: A number multiplied by itself; 3 squared = $3^2 = 3 \times 3 = 9$

$$6 \text{ squared} = 6^2 = 6 \times 6 = 36$$

We can use any number as a power and use repeated multiplication to work out its value: $5^3 = 5 \times 5 \times 5 = 125$ $2^6 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 64$

$$\begin{array}{r} 1) \quad 368 \\ + \quad 37 \\ \hline \end{array}$$

$$\begin{array}{r} 2) \quad 894 \\ + \quad 277 \\ \hline \end{array}$$

$$\begin{array}{r} 3) \quad 537 \\ + \quad 66 \\ \hline \end{array}$$

$$\begin{array}{r} 4) \quad 46 \\ - \quad 13 \\ \hline \end{array}$$

$$\begin{array}{r} 5) \quad 372 \\ - \quad 45 \\ \hline \end{array}$$

$$\begin{array}{r} 6) \quad 425 \\ - \quad 189 \\ \hline \end{array}$$

$$\begin{array}{r} 7) \quad 32 \\ \times \quad 6 \\ \hline \end{array}$$

$$\begin{array}{r} 8) \quad 207 \\ \times \quad 4 \\ \hline \end{array}$$

$$\begin{array}{r} 9) \quad \underline{\hspace{2cm}} \\ 4) \quad 2408 \\ \hline \end{array}$$

$$\begin{array}{r} 10) \quad \underline{\hspace{2cm}} \\ 7) \quad 903 \\ \hline \end{array}$$

- 11) A company produces 45280 cakes in one hour. They put 8 cakes in a box. How many boxes can they fill in one hour?
- 12) Mr Smith is paid £1350 per month. How much does he earn in 6 months?
- 13) A car showroom sells 34 cars in June, 28 cars in July and 129 cars in August. How many cars do they sell altogether?



14) Find the value of a) 4^3 b) 2^4

15) Last month a magazine sold 14732 copies. This month their sales were down by 974. How many magazines were sold this month?

16) How many days are there in total in September, October, November and December?

- 17) A school trip is going to Edinburgh zoo. There are 178 pupils and 9 teachers.
- How many 52 seater buses will be needed?
 - How many empty seats will there be?
- 18) Last year, an estate agent sold 429 houses. This year, they doubled their house sales. How many houses did they sell this year?
- 19) Granny Smith won £8520 at the bingo. She wanted to share it equally between her six grandchildren. How much did each child get?
- 20) Jenny works every day from Monday to Friday. She was paid £68 per day. On Saturday she worked extra, as someone was off ill. She was paid £79 on Saturday. How much money did she make altogether for her work?

21) Which is larger: 4^5 or 5^4 ? Justify your answer by calculation

- 22) a) How many days are there in 3 years, if none of them are a leap year?
 b) How many days are there in 6 years, if two years have been leap years?

23) A survey showed that in one day, 29935 vehicles crossed over a busy bridge.



- Round this figure to the nearest 10?
- Round this figure to the nearest 100?

24) At a football match, the attendance was 19729.

- Round this figure to the nearest 100?
- Round this figure to the nearest 1000?

25) A box of ChocoFlakes weighs 375 grams. Approximately, what is the weight of 18 boxes?



26) Put these values in order of size, smallest to largest: 2^7 , 7^2 , 15^0 , 10^3

27) A group of 8 people are going on holiday. They have a choice of booking family rooms costing £105 each (one room sleeps 4), double rooms costing £55 each (one room sleeps 2) or deluxe rooms costing £85 each (one room sleeps 3). You must book the same type of room for everyone. What is the cheapest option?

Order of Operations

When carrying out a calculation we do not necessarily start at the left and work to the right. BIDMAS reminds us to do brackets first, then indices (powers) then division and multiplication and, finally, addition and subtraction For example:-

$$\begin{aligned} 3 \times 4 + 5 \times 3 \\ = 12 + 15 \\ = 27 \end{aligned}$$

$$\begin{aligned} 3 + 20 \div 5 + 5 \\ = 3 + 4 + 5 \\ = 12 \end{aligned}$$

$$\begin{aligned} (3 + 20) \div (5 + 5) \\ = 23 \div 10 \\ = 2.3 \end{aligned}$$

$$\begin{aligned} (2 + 3 + 4)^2 \\ = 9^2 \\ = 81 \end{aligned}$$

Now try these examples:-

$$28) 4 \times 5 - 6 \times 3$$

$$29) 4 + 5 \times 6 + 3$$

$$30) 20 \div 2 - 20 \div 10$$

$$31) 20 + 20 \times 2 + 10$$

$$32) 3 \times (4 + 5)$$

$$33) 3 \times 4 + 5$$

$$34) 20 + 10 \div 2$$

$$35) (20 + 10) \div 2$$

$$36) 1^2 + 2^2 + 3^2$$

$$37) (1 + 2)^2 + 3^2$$

$$38) 1^2 + (2 + 3)^2$$

$$39) (1 + 2 + 3)^2$$

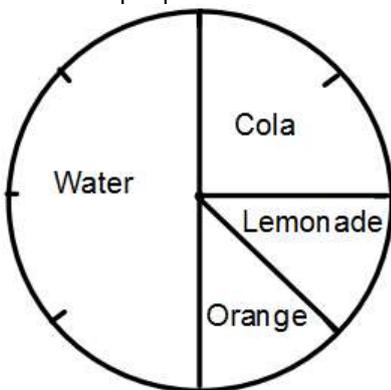
Revision of Graphs and Charts

Any graph or chart should always have a title, the axes labels and a sensible scale, clearly shown. Rulers should be used where necessary. In a Pie chart, sections should be labelled.

1) Draw and label a neat bar graph for the following information about Primary 5 Pets.

Pet	Cat	Dog	Rabbit	Budgie	Rat	Fish
Number of Pupils	5	9	4	3	2	6

2) This pie chart shows favourite drinks in a class. Make a list of drinks from most popular to least popular.



- Write down the fraction of the class who liked water.
- Write down the fraction of the class who liked lemonade.
- If there are 20 children in the class, how many liked cola?

3) The charges for a delivery service are shown in the table.

a) What is the charge for each of the following deliveries:-

i) 3 kg delivered 4km?

ii) 9kg delivered 14km?

iii) 12kg delivered 8km?

Distance \ Weight	Under 5km	Between 5km – 10km	Over 10km
1 – 5 kg	£4.75	£6.50	£9.20
6 – 10kg	£6.50	£8.25	£10.85
Over 10kg	£9.25	£10.75	£13.15

b) I pay £8.25 for a parcel delivery.
Give an example of the weight of the parcel and how far it was delivered.

4) Draw and label a neat line graph to display the number of goals scored by the school football team each month.

Month	Aug	Sept	Oct	Nov	Dec	Jan
Goals	15	26	17	32	8	19

Revision of Equations and Expressions

Simplifying Expressions

We collect all 'like terms' together when we simplify: $x + x$ becomes $2x$ (2 lots of x)

$$3a + 5 + 2a - 1 \text{ becomes } 5a + 4$$

$$4x - 4y - 2x + y \text{ becomes } 2x - 3y$$

An expression is different from an equation as it does not have an equal sign with it. An equation always has two sides – even if one side is equal to zero.

Solving Equations

You can either use the 'cover up' method or the 'balancing sides' method. Layout of work is very important and you should always show all steps. Remember to get all the letters on one side of the equation and all the numbers on the other side.

$$x + 5 = 12 \text{ (what number add 5 gives 12)}$$

$$x = 7$$

$$3x = 27 \text{ (3 lots of what number makes 27)}$$

$$x = 27 \div 3$$

$$x = 9$$

$$4x + 6 = 98$$

$$4x = 92$$

$$x = 92 \div 4$$

$$x = 23$$

$$5x - 1 = 2x + 11$$

$$3x - 1 = 11$$

$$3x = 12 \text{ (add 1 to both sides)}$$

$$x = 4$$

If you are given a problem to solve, try writing an equation to help. For example, four bottles of water plus 100ml equals 3060ml. How many millilitres are in one bottle of water?

Let b be the amount of water in one bottle, so

$$\begin{aligned}4b + 100 &= 3060 \\4b &= 2960 \\b &= 740\text{ml}\end{aligned}$$

Now answer these questions.

1) Collect all the like terms to simplify these expressions

a) $3x + 5x - 2x$ b) $7p - 2p + 11p$ c) $2x + 7 + 5x + 3$
d) $8x + 9y - 3x - 5y$ e) $4a - b + 5a + 2b$ f) $7m - 3n - 8m + n$

2) Solve the following equations

a) $x - 1 = 11$ b) $x + 6 = 15$ c) $3x = 12$ d) $2x = 14$
e) $3x - 1 = 11$ f) $2x + 6 = 15$ g) $4x + 3 = 23$ h) $6w - 5 = 1$
i) $4t - 4 = 24$ j) $2k + 19 = 25$ k) $10p + 48 = 108$ l) $20h - 41 = 39$
m) $4f - 1 = f + 23$ n) $5x + 11 = 19 - 3x$
o) $5t - 2 = 2t + 16$ p) $6x + 1 = 4x + 13$
q) $\frac{1}{2}x + 4 = 10$ r) $\frac{1}{4}y + 2 = 4$
s) $8 = \frac{1}{2}b + 6$ t) $\frac{1}{8}x - 1 = 2$

3) Four bags of flour plus 1kg have a total weight of 13kg. Find the weight of one bag of flour.

4) Six eggs in a 15 gram box weigh 285 grams. Find the weight of one egg.

Revision of Fractions, Decimals and Percentages

Fractions

A fraction $\frac{3}{5}$ consists of two parts: a numerator (the top number 3) and a denominator (the bottom number 5).

If you want to compare fractions, you need to get the denominators to be the same number first, before deciding which fraction is greater e.g. $\frac{1}{4}$ and $\frac{5}{12}$

Change the denominator from 4 into 12 by multiplying by 3 and do the same to the top number as well $\frac{1}{4}$ becomes $\frac{3}{12}$, then compare: $\frac{5}{12}$ is greater

Equivalent fractions

The same fraction can be written several ways, but usually try to work with the simplest form: $\frac{1}{3} = \frac{2}{6} = \frac{3}{9} = \frac{4}{12} = \frac{5}{15}$ and so on...

Fractions of a quantity

To find a fraction of a quantity, divide by the denominator and then multiply by the numerator.

$$\frac{1}{4} \text{ of } 24 = 24 \div 4 = 6$$

$$\frac{1}{7} \text{ of } 252 = 252 \div 7 = 36$$

$$\frac{3}{5} \text{ of } 45 = 45 \div 5 = 9 \times 3 = 27$$

$$\frac{7}{8} \text{ of } 448 = 448 \div 8 = 56 \times 7 = 392$$

Now answer these questions – remember to show all working where necessary.

- 1) Write out four equivalent fractions to a) $\frac{1}{5}$ b) $\frac{2}{5}$ c) $\frac{3}{7}$
- 2) Simplify the following fractions a) $\frac{3}{15}$ b) $\frac{2}{40}$ c) $\frac{75}{100}$
- 3) Which fraction is greater a) $\frac{2}{5}$ or $\frac{1}{2}$ b) $\frac{3}{4}$ or $\frac{5}{7}$
- 4) Calculate a) $\frac{1}{5}$ of 65 b) $\frac{1}{6}$ of 120 c) $\frac{1}{4}$ of 52 d) $\frac{1}{3}$ of 72
- 5) Calculate a) $\frac{2}{5}$ of 75 b) $\frac{2}{3}$ of 81 c) $\frac{3}{7}$ of 406 d) $\frac{7}{9}$ of 1107
- 6) There are 495 people in an office building. $\frac{5}{9}$ of them are women. How many women are there? How many men are there?
- 7) I spent $\frac{1}{5}$ of my money on a magazine and still had £10.20 left. How much must I have started with?
- 8) Jim drove $\frac{2}{5}$ of the way from Dundee to Perth. He still had 12 miles to go. How far is it from Dundee to Perth?

Decimals and Percentages

A decimal is a value which includes tenths or hundredths of a unit.

3.14 = 3 units, 1 tenth and 4 hundredths, or 3 units and 14 hundredths. It is important to be able to use these to help convert fractions into percentages. One percent is one out of one hundred

$$0.5 = 0.50 = 50 \text{ hundredths} = \frac{50}{100} = 50\% \quad 0.01 = 1 \text{ hundredth} = \frac{1}{100} = 1\%$$

Finding a percentage without a calculator

Always find 10% first – just divide the given number by 10: 10% of 640 = $640 \div 10 = 64$

If you need 30% - it is 3 times 10%, so 30% of 640 = $3 \times 64 = 192$

Then find 1% - just divide your answer for 10% by 10: 1% of 640 = $64 \div 10 = 6.4$

If you need

To use a calculator, change the percentage into the decimal equivalent, then multiply by the given number: 35% of 640 = $0.35 \times 640 = 224$

To convert a score into a percentage, divide the numerator by the denominator and then multiply by 100: $\frac{21}{24}$ in geography is a percentage of 87.5% ($21 \div 24 \times 100$)

Now try these:-

- 1) Calculate, without a calculator, 10%, 20%, 50% 75% of 830
- 2) Calculate, without a calculator, 10%, 20%, 25%, 50% 75% and 80% of 5400

Use a calculator for the following questions (write out as in the example above)

- 3a) 17% of £90 b) 4% of £305 c) 89% of £1200
- 4a) 58% of £120 b) 7% of £2456 c) 63% of £12,345
- 5) 380 people work in a building. 70% are men. How many men work in the building?
- 6) A TV cost £450, but a special discount was offered of 15%. How much money was taken off the price of the TV? How much did the TV now cost?
- 7) A college noticed that 18% of its new students dropped out by the end of the first year. If there were 1450 new students, how many dropped out?
- 8) The diameter of Mars is only 55% of the diameter of Earth. If the diameter of Earth is 13000km, what is the diameter of Mars?
- 9) My bank charges me 3% to change my holiday money into dollars. If I change £1200 into dollars, how much am I charged?
- 10) My cotton shirt is actually made up of 7% polyester. If my shirt weighs 720grams, what weight of polyester is there?
- 11) 56% of the population of Scottown are senior citizens. If Scottown has 16 700 inhabitants, how many are senior citizens?
- 12) Convert these scores into percentages and then decide which is Jen's best subject.

History	$\frac{13}{20}$	ICT	$\frac{15}{25}$	French	$\frac{14}{21}$	English	$\frac{12}{17}$
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Revision of Multiples, Factors and Primes

Multiples

A multiple of a number is the number multiplied by any other value. Usually we think of the 'times tables'

e.g. Multiples of 5 are:- 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60 etc.

Multiples of 12 are:- 12, 24, 36, 48, 60, 72, 84, 96 etc.

The **lowest common multiple** of two numbers is the lowest number that appears in both multiple lists: l.c.m. of 5 and 12 is 60.

Factors

Factors are numbers that divide exactly into a given value.

e.g. Factors of 9 are:- 1, 3, 9

Factors of 24 are:- 1, 2, 3, 4, 6, 8, 12, 24

Factors of a number always include 1 and the number itself.

The **highest common factor** is the highest factor that appears in both lists: h.c.f. of 9 and 24 is 3.

Prime Numbers

A prime number is a number that only has TWO factors: 1 and the number itself.
e.g. 3 is a prime number as only 1 and 3 are its factors.
The only even prime number is 2.

Now try to answer the following questions

- 1) List the first ten multiples of 8
- 2) List the first five multiples of 15
- 3) Find the l.c.m. of 6 and 8
- 4) Find the l.c.m. of 10 and 7
- 5) Find the l.c.m. of 2, 3 and 4
- 6) Write down the factors of 28
- 7) Write down the factors of 100
- 8) Find the h.c.f. of 20 and 30
- 9) Find the h.c.f. of 24 and 36
- 10) Write down the first five prime numbers.
- 11) Explain why 9 is not a prime number.
- 12) For each number, list all of its factors and say whether it is a prime number or not.
 - a) 10
 - b) 21
 - c) 47
 - d) 1

Revision of Negative Numbers Remember to use a number line to help.

Negative numbers are less than zero – they appear to the left of zero on a number line and on a coordinate diagram. It is useful to think about temperatures when we are adding or subtracting involving negative numbers.

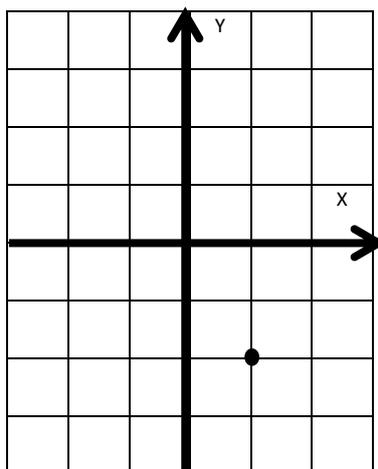
$$2 + (-9) = -7 \qquad -9 + 3 = -6 \qquad -9 - 6 = -15$$

Now try these:-

- a) $3 + (-10)$
- b) $0 + (-4)$
- c) $15 + (-6)$
- d) $7 + (-20)$
- e) $-4 + 2$
- f) $-14 + 8$
- g) $-20 + 25$
- h) $-1 + 8$
- i) $-1 - 3$
- j) $-5 - 8$
- k) $-15 - 1$
- l) $-24 - 6$
- m) Find the distance between a fish swimming 5m under the water and a balloon 28m above the water.

Coordinates

Write down the coordinates of the point marked on the diagram below.

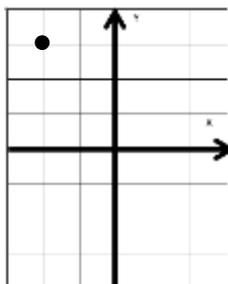


The correct answer to this question is $(1, -2)$: from the origin (centre) one to the right and two down to reach the point A hence the coordinates of the point A are $(1, -2)$.

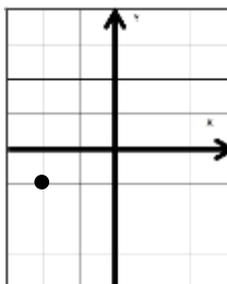
Remember if the first coordinate is positive go to the right and if it is negative go to the left. If the second coordinate is positive go up and if it is negative go down.

Write down the coordinates of each point in the following examples.

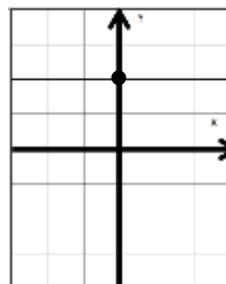
2)



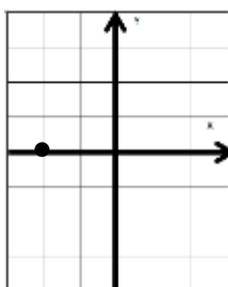
3)



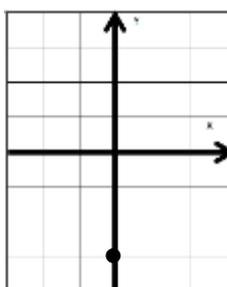
4)



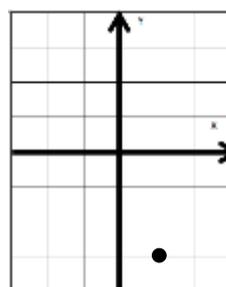
5)



6)



7)



Revision of Area and Volume

Area of a rectangle = length x breadth Area of a triangle = $\frac{1}{2}$ x base x height

When an area is made up of two or more shapes, we can split it up and calculate each area separately, then add the answers together.

Area is measured in square units: mm², cm², m²

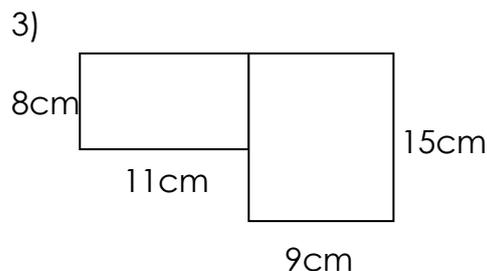
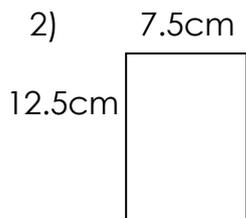
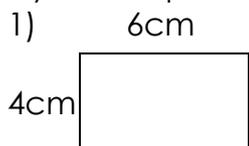
Volume of a cube/cuboid = length x breadth x height

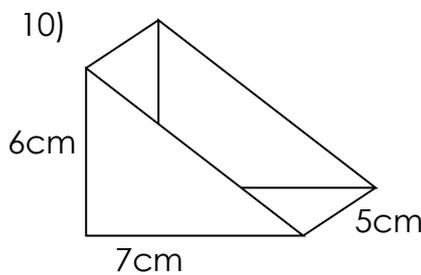
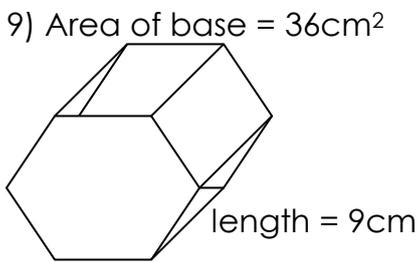
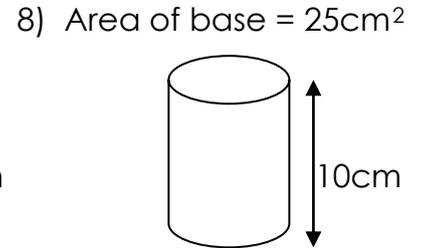
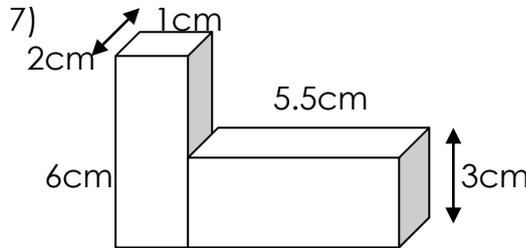
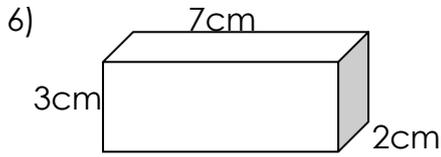
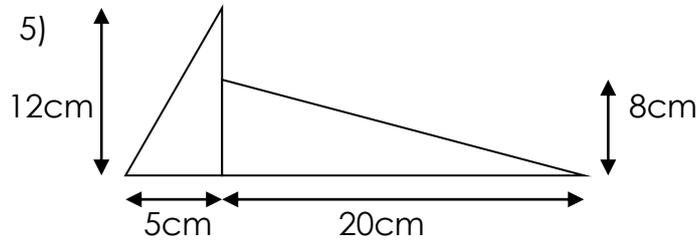
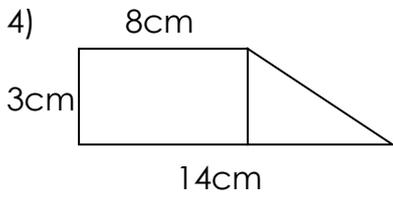
Volume of a prism = area of base x height

Volume is measured in cubic units: mm³, cm³, m³.

1 litre = 1000cm³ = 1000ml

Try these questions





Revision of Probability and Sampling

Probability is the likelihood or chance of something happening.

0.....0.51
 Impossible unlikely even chance likely certain

If today is Monday, tomorrow will be Friday: impossible

If I flip a coin, it will land Tails: even chance

Christmas Day will be in December: certain

Probability can be calculated – the answer will always be between 0 and 1

Probability of an event = $\frac{\text{number of favourable outcomes}}{\text{number of possible outcomes}}$

A bag contains 10 cubes numbered from one to ten. One is picked out at random.

$P(\text{five}) = \frac{1}{10}$

$P(\text{even number}) = \frac{5}{10}$

$P(\text{number greater than 7}) = \frac{3}{10}$

Try these questions:

1) A bag contains 3 red sweets, 6 green sweets and 9 yellow sweets. If a sweet is picked at random, what is the probability that the sweet will be:-

- a) red
- b) green
- c) blue
- d) yellow



2) A bag contains 20 raffle tickets. Four tickets win £10, one ticket wins a car and the rest are losing tickets. Find:-

- a) P(win £10)
- b) P(losing ticket)
- c) P(win car)
- d) P(not win £10)

3) A twelve sided dice is rolled during a game of dungeons and dragons. Find:-

- a) P(less than 4)
- b) P(Prime number)
- c) P(multiple of 3)
- d) P(factor of 12)
- e) P(zero)
- f) P(even number)

4) In the word MISSISSIPPI, what is the probability that a letter chosen at random is:-

- a) P(letter I)
- b) P(letter T)
- c) P(letter P)

Revision of Speed, Distance and Time

Depending on what you are asked to find, use one of the following formulae:-

$$\text{Distance} = \text{Speed} \times \text{Time}$$

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

$$\text{Time} = \frac{\text{Distance}}{\text{Speed}}$$

Remember to check what units are used and to use the correct units within calculations.

Examples:

A car travels 50mph for 4 hours. How far does it travel?

$$\begin{aligned} D &= S \times T \\ &= 50 \times 4 \\ &= 200 \text{ miles} \end{aligned}$$

A plane flies 1150 miles in 5 hours. What is its speed?

$$\begin{aligned} S &= D \div T \\ &= 1150 \div 5 \\ &= 230 \text{ mph} \end{aligned}$$

How long would it take to run 6km, at 12km/hr?

$$\begin{aligned} T &= D \div S \\ &= 6 \div 12 \\ &= 0.5 \text{ hours} \\ &= 30 \text{ minutes} \end{aligned}$$

Remember: 60 minutes in 1 hour, 30 minutes=0.5 hours, 15 minutes=0.25 hours

Use the same layout as above and try the following questions:-

- 1a) Find the distance covered by a train travelling at 85 km/hr for 4 hours.
- b) Find the distance covered by a jet travelling for 5 hours at a speed of 450 m.p.h.
- c) Find the speed of a bird flying 28 kilometres and taking 2 hours.
- d) Find the time it takes a dog, running at 4 metres/sec, to cover 20 metres.

2. Change the following times to decimal form:-

- (a) 1 hr 30 minutes (b) 45 minutes (c) 4 hrs 15 minutes
(d) 6 hrs 15 minutes (e) 30 minutes (f) 10 hours 45 minutes

- 3a) Find the distance covered by a train travelling at 85 km/hr for $2\frac{1}{2}$ hours.
- b) Find the distance covered by a jet travelling for $3\frac{1}{4}$ hours at a speed of 450 m.p.h.
- c) Find the speed of a bird flying 27 kilometres and taking $1\frac{1}{2}$ hours.
- d) Find the time it takes a cat, running at 4 metres/sec, to cover 26 metres.

- 4a) Roger is practising his return of serve against an automatic serving machine. He stands 20 metres away from the machine. How long does it take the ball to reach him, at 10m/s?
- b) The average speed of traffic on a new bypass was 66km/h. What distance did the vehicles cover in 30 minutes?
- c) How long would it take a car to travel 15 miles, if its speed is 60m.p.h? Give your answer in hours and minutes.

Revision of Formulae and Substitution

Substitution of Numbers

Remember that the layout of work is important and that $3y$ means 3 times y . Also y^2 means y times by itself.

Always write out the expression first, then substitute in the numbers, then use BIDMAS to work out the answer.

Examples $a = 4$ and $b = 6$

a) $2a + b$	b) $5ab - 3$	c) $b^2 - 3a$	d) $\frac{1}{2}b$	e) $\frac{b}{a}$
$= 2 \times 4 + 6$	$= 5 \times 4 \times 6 - 3$	$= 6^2 - 3 \times 4$	$= \frac{1}{2} \times 6$	$= \frac{6}{4}$
$= 8 + 6$	$= 120 - 3$	$= 36 - 12$	$= 3$	$= \frac{3}{2}$
$= 14$	$= 117$	$= 24$		

Now try these questions, setting the work out carefully

1) For $r = 3$, $s = 5$ and $t = 1$, calculate

- a) $5r + s + t$ b) $r + 2s - 7$ c) $rs - t$ d) $15 - 3rt$

2) For $p = 6$ and $q = 8$, calculate

a) $12 - \frac{1}{2}q$

b) $10 + 5q$

c) $20 - 3p$

d) p^2

Formulae

If we are told a rule in words, we can write a formula.

Example: At every table, two people sit down => number of people = 2 x number of tables

$$P = 2 \times T$$

We can then use this rule to calculate the number of people when we know the number of tables. If we have 35 tables, then $P = 2 \times 35$

$$P = 70 \quad \text{70 people can sit at the 35 tables}$$

Try to write rules, then use them to calculate the answers.

1) One **h**exagon is made up of 6 **s**ticks, so number of sticks $S = \dots \times H$

No. of hexagons h	1	2	3	4	5
No of sticks s	6	12

How many sticks are needed to make 20 hexagons?

2) One **b**ook costs £8, so **c**ost of books = ... x b

No of books b	1	2	3	4	5
Cost in pounds C	8	16

What is the cost of buying 18 books?

Revision of Angles

Remember: Acute angle is less than 90° Right angle is 90°

Obtuse angle is greater than 90° but less than 180°

Reflex angle is greater than 180°

Straight angle is 180°

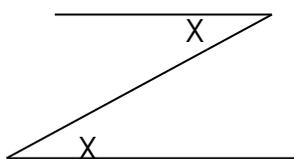
Angles around a point add up to 360°

Two angles making a right angle always add to 90° . These are called complementary angles.

Two angles making a straight angle always add to 180° . These are called supplementary angles.

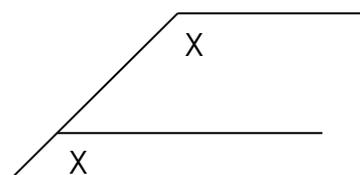
The three angles in a triangle add to 180° .

Alternate Angles (Z or N angles)

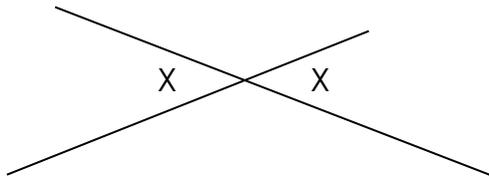


The marked angles have the same size.

Corresponding Angles (F angles)



Vertically Opposite Angles (X angles)

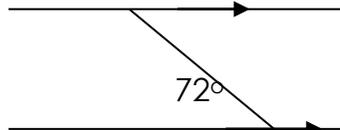


Using these facts, copy out and complete all the missing angles in these diagrams:

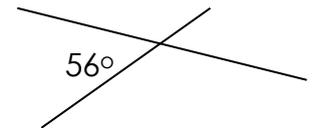
1)



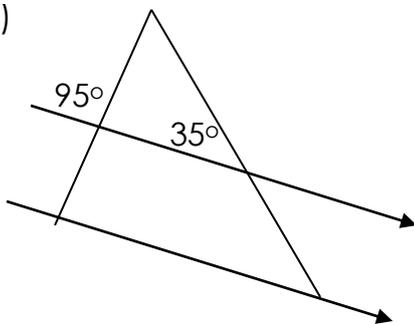
2)



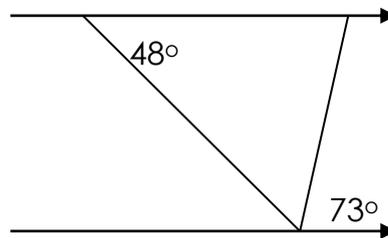
3)



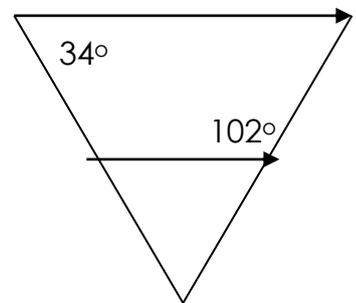
4)



5)



6)



Answers

Whole Numbers

- 1) 405 2) 1171 3) 603 4) 33 5) 327 6) 236 7) 192
 8) 828 9) 602 10) 129 11) 5660 12) £8100 13) 191 cars 14a) 64
 14b) 16 15) 13758 16) 122 days 17a) 4 buses 17b) 21 seats 18) 858 houses
 19) £1420 20) £419 21) 4⁵ is larger 22a) 1095 days 22b) 2192 days
 23a) 29940 23b) 29900 24a) 19700 24b) 20000 25) 6750g 26) 15⁰, 7², 2⁷, 10³
 27) Family rooms £210 28) 2 29) 37 30) 8 31) 70 32) 27 33) 17 34) 25 35) 15 36) 14 37) 18
 38) 26 39) 36

Graphs and Charts

- 2a) $\frac{1}{2}$ 2b) $\frac{1}{8}$ 2c) 5 children 3ai) £4.75 3aii) £10.85 3aiii) £10.75
 3b) 6-10kg going 5-10km

Equations and Expressions

- 1a) $6x$ b) $16p$ c) $7x + 10$ d) $5x + 4y$ e) $9a + b$ f) $-m - 2n$
 2a) $x = 12$ b) $x = 9$ c) $x = 4$ d) $x = 7$ e) $x = 4$ f) $x = 4.5$
 g) $x = 5$ h) $w = 1$ i) $t = 7$ j) $k = 3$ k) $p = 6$ l) $h = 4$
 m) $f = 8$ n) $x = 1$ o) $t = 6$ p) $x = 6$ q) $x = 12$ r) $y = 8$
 s) $b = 4$ t) $x = 24$
 3) bag = 3kg 4) egg = 45g

Fractions

- 1a) $\frac{2}{10}, \frac{3}{15}, \frac{10}{50}, \frac{5}{25}$ b) $\frac{4}{10}, \frac{20}{50}, \frac{3}{15}, \frac{8}{20}$ c) $\frac{6}{14}, \frac{9}{21}, \frac{12}{28}, \frac{30}{70}$

- 2a) $\frac{1}{5}$ b) $\frac{1}{20}$ c) $\frac{3}{4}$
 3a) $\frac{1}{2}$ b) $\frac{3}{4}$
 4a) 13 b) 20 c) 13 d) 24
 5a) 30 b) 54 c) 174 d) 861
 6) 275 women, 220 men 7) £12.75 8) 20 miles

Decimals and Percentages

- 1) 83, 166, 415, 622.5 2) 540, 1080, 1350, 2700, 4050, 4320 3a) £15.30 b) £12.20
 c) £1068 4a) 69.60 b) 171.92 c) £7777.35 5) 266 men 6) £67.50 off,
 new price = £382.50 7) 261 students 8) 7150 km 9) £36 10) 50.4g
 11) 9352 12) History 65% ICT 60% French 67% English 71%

Multiples, Factors and Primes

- 1) 8, 16, 24, 32, 40, 48, 56, 64, 72, 80 2) 15, 30, 45, 60, 75 3) 24 4) 70
 5) 12 6) 1, 2, 4, 7, 14, 28 7) 1, 2, 4, 5, 10, 20, 25, 50, 100 8) 10 9) 12
 10) 2, 3, 5, 7, 11 11) 9 has 3 as a factor 12a) 1, 2, 5, 10 not prime b) 1, 3, 7, 21 not prime
 c) 1, 47 prime d) 1, not prime, only one factor

Negative Numbers

- a) -7 b) -4 c) 9 d) -13 e) -2 f) -6 g) 5
 h) 7 i) -4 j) -13 k) -16 l) -30 m) 33m
 2) (-2,3) 3) (-2,-1) 4) (0,2) 5) (-2,0) 6) (0,-3) 7) (1, -3)

Area and Volume

- 1) 24cm² 2) 93.75cm² 3) 88 + 135 = 223cm² 4) 24 + 9 = 33cm²
 5) 30 + 80 = 110cm² 6) 42cm³ 7) 12 + 33 = 45cm³ 8) 250cm³ 9) 324cm³
 10) 105cm³

Probability and Sampling

- 1a) $P(\text{red}) = \frac{3}{18} = \frac{1}{6}$ b) $P(\text{green}) = \frac{6}{18} = \frac{1}{3}$ c) $P(\text{blue}) = 0$ d) $P(\text{yellow}) = \frac{1}{2}$
 2a) $P(\text{win } \pounds 10) = \frac{4}{20} = \frac{1}{5}$ b) $P(\text{losing ticket}) = \frac{15}{20} = \frac{3}{4}$ c) $P(\text{win car}) = \frac{1}{20}$ d) $P(\text{not win } \pounds 10) = \frac{16}{20}$
 3a) $P(\text{less than 4}) = \frac{3}{12}$ b) $P(\text{Prime number}) = \frac{5}{12}$ c) $P(\text{multiple of 3}) = \frac{4}{12}$
 3d) $P(\text{factor of 12}) = \frac{6}{12}$ e) $P(\text{zero}) = 0$ f) $P(\text{even number}) = \frac{6}{12}$
 4a) $P(\text{letter I}) = \frac{4}{11}$ b) $P(\text{letter T}) = 0$ c) $P(\text{letter P}) = \frac{2}{11}$

Speed, Distance and Time

- 1a) 340 km b) 2250 miles c) 14 km/h d) 5 secs
 2a) 1.5 hours b) 0.75 hours c) 4.25 hours d) 6.25 hours e) 0.5 hours
 f) 10.75 hours
 3a) 212.5 km b) 1462.5 miles c) 18 km/h d) 6.5 secs
 4a) 2 secs b) 33km c) 0.25 hours = 0 hours and 15 minutes

Substitution

- 1a) 21 b) 6 c) 14 d) 6
 2a) 8 b) 50 c) 2 d) 36

Formulae

- 1) $S = 6 \times H$; 18, 24, 30 120 sticks
 2) $c = 8 \times b$; 24, 32, 40 £144

Angles

- 1) 56 2) 108 and 72 3) 56 and 124 4) 85, 60, 35, 145 5) 132, 59, 107 6) 34, 78, 68

