**Level 6**

**PROMPT sheet**

**6/1 Equivalent fractions, decimals &**

**percentages**

* **Percentage to decimal to fraction**

27% = 0.27 = 

7% = 0.07 = 

70% = 0.7 =  = 

* **Decimal to percentage to fraction**

0.3 = 30% = 

0.03 = 3% = 

0.39 = 39% = 

* **Fraction to decimal to percentage**

 = = 80% = 0.8

*Change to 100*

 = 3 ÷ 8 = 0.375 = 37.5%

**6/2 Increase/Decrease by a percentage**

* **To increase £12 by 5%**

**= 1.05 x £12 *(100% + 5% = 105%)***

***OR***

***= £12 + 5% of £12***

* **To decrease £50 by 15%**

**= 0.85 x £50 *(100% - 15% = 85%)***

**OR**

**= £50 – 15% of £50**

**6/3 Divide a quantity into a given ratio**

~ Put headings

~Find how many shares in total

~ Amount ÷ no. shares = value of one share

e.g. Divide £240 between A and B in ratio

of 3:5

A : B

3 : 5 = 8 shares

One share = £240 ÷ 8 = £30

A = 3 shares = 3 x £30 = £90

B = 5 shares = 5 x £30 = £150

**6/4 Use proportional reasoning**

* **Change an amount in proportion**

e.g. If 6 books cost £22.50

Find the cost of 11. *(find cost of 1 first)*

* **Change amounts to compare**

e.g. A pack of 5 pens cost £6.10

A pack of 8 pens cost £9.20

Which is the best buy? *(find cost of 40 of each)*

**6/5 Calculate with fractions**

* **Add & subtract fractions**

~Make the denominators the same

e.g.  +   -

= + =  - 

=  = 

* **Multiply fractions**

~Write 7 as 

~Multiply numerators & denominators

e.g. 5 x   x 

= x = 

=  = 3

* **Divide fractions**

~Write 7 as 

~Flip numerator & denominator after ÷

~Multiply numerators & denominators

e.g. 5 ÷   ÷ 

= x =  x 

=  = 7 = = 1 = 1

* **Calculate fraction of quantity**

To find  of a quantity ÷ 5 x 4

e.g.  of £20 = 20 ÷ 5 x 4 = £16

**6/6 Solve an equation by trial &**

**improvement method**

~ Find 2 consecutive numbers that the

solution lies between

~ Then choose the half way number

~ Keep making improvements until the

required accuracy achieved

e.g. To solve x3 – 3x = 6 (correct to 1dp)

Solution is nearer 2.4 than 2.3

So x = 2.4 (correct to 1dp)

**6/7 Solve linear equations**

~Multiply out brackets first

~If there are letters on both sides get rid

of the smaller first

~Do the same to both sides

e.g.

To solve 5(x – 3) = 3x + 7 (expand bracket)

5x – 15 = 3x + 7(-3x from both sides)

2x – 15 = + 7 (+15 to each side)

2x = 22 (÷2 both sides)

2 2

x = 11

6/8 **Sequences**

* **Understand position and term**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Position | 1 | 2 | 3 | 4 |
| Term | 3 | 7 | 11 | 15 |

+4

Term to term rule = +**4**

Position to term rule is x **4** - 1

*(because position 1 x 4 – 1 = 3)*

nth term = n x 4 -1 = 4n - 1

* **Generate terms of a sequence**

If the nth term is 5n + 1

1st term *(n=1)* = 5x1 + 1 = 6

2nd term *(n=2)* = 5x2 + 1= 11

3rd term *(n=3)* = 5x3 + 1 = 16

6/9 **Plot graphs of linear equations**

~Substitute values of x into the equation

~Plot the points in pencil

~Join the points with a ruler and pencil

~They should be in a straight line

|  |  |  |
| --- | --- | --- |
| Try x = | x3 – 3x | Comment |
| 2 | 23 – 2x2=4 | Too small |
| 3 | 33 – 3x3=28 | Too big |
| 2.5 | 2.53 – 3x2.5=8.125 | Too big |
| 2.3 | 2.33 – 3x2.3=5.267 | Too small |
| 2.4 | 2.43 – 3x2.4=6.624 | Too big |
| 2.35 | 2.353 – 3x2.35=5.928 | Too small |

**e.g. y = 3x – 1**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| x | -2 | -1 | 0 | 1 | 2 |
| y | -7 | -4 | -1 | 2 | 5 |

**6/10&11 Real life graphs**

**Some examples**

A

1400

1430

1500

1530

1600

1630

Time of day

50

40

30

20

10

0

Distance

from home

(km)

A

B

C

D

* AB shows the journey away
* BC shows no movement
* CD shows journey back
* The steeper the line the higher the speed



**6/12 Quadrilaterals & their properties**

Square rectangle parallelogram

Rhombus trapezium kite

* Know the name of each quadrilateral
* Does it have line and/or rotational symmetry?
* Are the diagonals equal or bisect each other?
* Does it have parallel sides?
* Are angles equal or opposites equal?
* Are the sides equal or opposites equal?

**6/13&14&15 Angles**

* **Angles & parallel lines**

F–shape Z-shape C or U shape

Corresponding Alternate Interior

angles angles add up to 1800

are equal are equal

* **Angles and straight lines**

Straight line = 1800 Opposite angles are equal

* **Angles of polygons**

~Polygons have straight sides

~Polygons are named by the number sides

3 sides – triangle

4 sides – quadrilateral

5 sides – pentagon

6 sides – hexagon

7 sides – heptagon

8 sides – octagon

9 sides – nonagon

10 sides - decagon

~With ALL sides equal they are called REGULAR

~ Sum of exterior angles is always 3600

1080 720

~ the interior & exterior angle add up to 1800

~ the interior angles add up to:

Triangle = 1 x 1800 = 1800

Quadrialteral =2 x 1800 = 3600

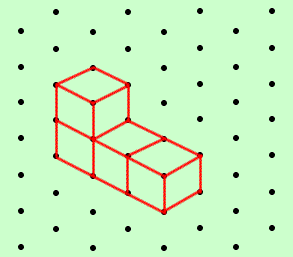
Pentagon = 3 x 1800 = 5400

Hexagon = 4 x 1800 = 7200 etc

**6/16 2D representations of 3D shapes**

* **3D drawing on isometric paper**

(notice NO horizontal lines)



* **3 views of a 3D shape**

Plan view

s

i

d

e

–

v

i

e

w

front elevation

Side view Plan view Front elevation

* **Nets**

Cube Cuboid Square based

pyramid

**6/17 Enlarge a shape**

You need to know:

* Centre e.g. ( 5, 4)
* Scale factor e.g. 2

****

**6/18 Translate & Reflect a shape**

* **Translate a shape**

You need to know:

* Vector from A to B e.g. 3 Right

-4 Down

****

B

A

Notice:

* The new shape stays the same way up
* The new shape is the same size

*USE TRACING PAPER TO HELP*

* **Reflect a shape**

**You need to know:**

* **Angle e.g. 900**
* **Direction e.g. clockwise**
* **Centre of rotation e.g.(0,0)**

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*USE TRACING PAPER TO HELP*

**6/19 Constructions**

* **Perpendicular bisector of a line**



* **Bisector of a line**



* **Construct triangle given 3 sides**

*(Use a pair of compasses*

*Leave the arcs on)*

3cm 5cm

7cm

* **Construct triangle given angles**

*(Use a protractor)*

230 570

7cm

**6/20 Use formulae**

* **Area of circle**

Area of circle = π x r2

= π x r2

= π x 52  5cm

= 78.5cm2

* **Circumference of circle**

Area of circle = π x d

= π x 8

= 25.1cm 8cm

* **Volume of cuboid**

Volume = l x w x h

= 5 x 3 x 2

= 30cm3 3cm

2cm

5cm

* **Surface area of cuboid**

Front = 5x3 = 15

Back = 5x3 = 15

Top = 5x2 = 10

Bottom = 5x2 = 10 Total Surface Area =62cm2

Side = 3x2 = 6

Side = 3x2 = 6

**6/23 Presentation of data**

* **Construct a pie chart**

|  |  |  |
| --- | --- | --- |
| **Transport** | **Frequency** | **Angle** |
| Car | 13 x 9 | 1170 |
| Bus | 4 x 9 | 360 |
| Walk | 15 x 9 | 135 |
| Cycle | 8 x 9 | 72 |

Total frequency = 40

3600 ÷ 40 = 90 per person

* **Construct a frequency polygon**

*(points plotted at the midpoint of the bars)*



* **Construct a scatter graph**



**6/24 Find all possible outcomes**

**Outcomes can be presented:**

* **In a list**
* **In a table or sample space**

**Example of a sample space**

To show all possible outcomes from spinning a spinner and rolling a dice

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Dice | | | | | |
|  | + | **1** | **2** | **3** | **4** | **5** | **6** |
| Spinner | **1** | 2 | 3 | 4 | 5 | 6 | 7 |
| **2** | 3 |  |  |  |  |  |
| **3** | 4 |  |  |  |  |  |
| **4** | 5 |  |  |  |  |  |



**6/25 Sum of mutually exclusive outcomes =1**

* **If 2 outcomes cannot occur together,**

**They are mutually exclusive**

* **If 2 outcomes A and B are mutually exclusive**

**P(A) + p(B) = 1**

* **If 3 outcomes A B and C are mutually exclusive**

**P(A) + p(B) + p(C) = 1**

e.g. If outcomes A, B and C are mutually

exclusive and

p(A) = 0.47

p(B) = 0.31

p(C) = 1 – (0.47 + 0.31)

= 1 – 0.78

= 0.22