Maths

Personal Learning Project (PLP)

Name
Remember

B  rackets  Do whatever is in the brackets first

O  rders  Then do powers, square roots etc.  
        Also known as BIDMAS where I is for indices

D  ivision  Next do the division

M  ultiplication  Next do the multiplication

A  ddition  Next do the addition

S  ubtraction  Next do the subtraction
BODMAS Matching

I can correctly use the order of operations to carry out calculations.

Match the calculation to the correct answer using your knowledge of BODMAS. One calculation has been done for you.

\[
\begin{align*}
72 + 46 \times 7 &= 37 \\
512 \div 8 - 27 &= 407 \\
1505 - 732 - 498 &= 281 \\
9 \times 828 \div 92 &= 806 \\
37 \times 43 - 1184 &= 394 \\
598 + 424 - 759 &= 81 \\
9^2 \times 3 + 38 &= 685 \\
582 + 28 \times 8 &= 34 \\
396 - 234 - 128 &= 275 \\
1000 - 45 \times 7 &= 263
\end{align*}
\]

Don’t forget your BODMAS order:
- Brackets
- Orders (exponents)
- Division and Multiplication
- Addition and Subtraction
BODMAS

I can solve expressions using the order of operations.

Here are some multi-part expressions. Complete the underlined part of the expression first then use the answer to that to complete the expression.

Here is an example: $3 \times (2 + 6)$

$$3 \times 8 = 24$$

1. $7 \times (8 - 3)$
2. $7 + 9 \times 2$
3. $10 \div (6 - 4)$
4. $12 \div (7 - 4)$
5. $(8 + 9) + 6^2$
6. $21 \div (4 + 3)$
7. $10 - 9 \div 3$
8. $7 + 6 \times 4$
9. $(12 + 20) \div 4$
10. $(13 - 6) \times 5$
11. $9 \times (3 + 3)$
12. $2^3 - (3 + 1)$
13. $(10 + 5) \div 5$
14. $12 \div (7 - 4)$
15. $(11 - 3) \times 7$

Decide which part of each expression to calculate first, underline and complete as above.

1. $(12 - 7) \times 8$
2. $9 + 2 \times 7$
3. $18 + (8 - 2)$
BODMAS

I can solve expressions using the order of operations.

1. \((12 + 8) ÷ 4 = \)\ \ 6. \((21 - 9) × 2 = \)\ \ 11. \((8 + 13) ÷ 7 = \)
2. \((5^2 + 10) ÷ 5 = \)
3. \((8 + 9) + 6^2 = \)
4. \(4 × 6 - 14 = \)
5. \(18 ÷ (4 + 5) = \)
6. \((21 - 9) ÷ 2 = \)
7. \(8 × 3 + 6 = \)
8. \(3 × (15 - 9) = \)
9. \(6^3 - (35 + 12) = \)
10. \((14 + 21) ÷ 5 = \)
11. \((7^2 + 11) ÷ 5 = \)
12. \(25 - 11 ÷ 2 = \)
13. \(9 + (10 - 7) = \)
14. \(26 - 3 × 7 = \)

Complete these calculations by filling in the missing number.

1. \(4 × [ ] - 25 = 23 \)
2. \((5 + 9) ÷ [ ] = 2 \)
3. \((60 ÷ 5) × 3 + [ ] = 6 \)
4. \((5 + 9) ÷ [ ] = 2 \)
5. \(9 × (12 - [ ] ) = 63 \)
6. \(45 = (5 + [ ] ) × 5 \)
7. \([ ] ÷ (7 - 2) = 3 \)
8. \(8^2 + (66 - [ ] ) = 86 \)
9. \(6 = [ ] ÷ (11 - 4) \)
**BODMAS**

I can solve expressions using the order of operations.

Calculate:

1. \((3 + 6) \times (8 - 5) = \) __________

2. \(7 + 8 \times 9 - 4 = \) __________

3. \(8 \times (6 + 3) + 5 = \) __________

4. \((19 - 7) + 8^2 + 9 = \) __________

5. \(9 \times (5 + 6) + 4 = \) __________

6. \(8 \div (7 - 5) \times 6 = \) __________

7. \(9 \times 3 + 18 + 9 = \) __________

8. \((124 + 2) \times 2^2 = \) __________

9. \(23 - 3 \times (5 + 8) = \) __________

10. \(8 + 7 \times (12 - 5) = \) __________

Put brackets in the following to make the answers correct.

1. \(6 \times 7 - 4 \times 8 = 10 \) \(6 \times 7 - 4 + 6 = 4 \)

2. \(8 \times 9 - 5 - 6 = 26 \) \(9 + 23 - 5 \times 5 = 7 \)

3. \(24 - 17 \times 8 - 16 = 40 \) \(5 + 11 + 7 - 3 = 4 \)

4. \(14 + 6 \times 4 - 32 = 6 \) \(7 + 6 \times 12 - 7 = 37 \)

5. \(9 \times 7 - 6 \times 3 = 27 \) \(15 + 9 + 6 - 4 = 0 \)

Use all the following numbers to create an expression using order of operations: 3, 4, 6, 12

______

______
1.

The perimeter of a rectangle is found using the formula.

\[ p = 2(l + w) \]

Where \( p \) is perimeter, \( l \) is length and \( w \) is width.

Use the formula to calculate the perimeter of a rectangle with length 24m and width 16m.

Show all your working.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

2.

Find the exact area of each circle.

1) \[ \text{Area} = \] 2) \[ \text{Area} = \] 3) \[ \text{Area} = \]

Formula to calculate area of a circle is:

\[ A = \pi r^2 \]
I can use a formula to calculate an answer.

**Remember**

\[ \text{Distance} = \text{Speed} \times \text{Time} \]

\[ \text{Speed} = \frac{\text{Distance}}{\text{Time}} \]

\[ \text{Time} = \frac{\text{Distance}}{\text{Speed}} \]

1. A car drives 120 miles in 3 hours.
   
   Calculate the average speed, in mph, of the car.

2. A lorry travels 100 miles at an average speed of 25 mph.
   
   Work out how long the journey lasts.

3. A pigeon flies for 7 hours at a speed of 70 km/h.
   
   Calculate how far the pigeon flies.

4. Matthew jogs 300 metres at 4m/s.
   
   Work out how long it takes Matthew.
Find the volume of the cuboid using the formula.

Volume = L x W x H (length x depth x height).

Show all of your working out.
Find the volume (V) of the cylinder using the formula.

\[ V = h \pi r^2 \]

Show all of your working and round your answer appropriately.

- Remember \( r = \text{radius} \). The radius of a circle is the measurement from the middle of the circle to the edge.

1. \( \text{Volume: } \) 
   \[ \text{Volume: } \]

2. \( \text{Volume: } \) 
   \[ \text{Volume: } \]

3. \( \text{Volume: } \) 
   \[ \text{Volume: } \]

4. \( \text{Volume: } \) 
   \[ \text{Volume: } \]

5. \( \text{Volume: } \) 
   \[ \text{Volume: } \]

6. \( \text{Volume: } \) 
   \[ \text{Volume: } \]
I can calculate the area of a given shape

Select a formula below to calculate the area of each shape.

Show your working and give all your answers to two decimal places.

Area of a rectangle = \( l \times w \) where \( l = \) length and \( w = \) width.

Area of a triangle = \( \frac{1}{2} \) base \( \times \) height.

Area of a circle = \( \pi r^2 \).

---

Area = ____________________________  

(2 marks)
To simplify fractions:

Find the common factors of both the numerator and the denominator and divide them both with that number. Keep simplifying until there are no further common factors to divide by.

**Simplifying Fractions**

**Examples:**

1. \[
\frac{10}{16} = \frac{5}{8}
\]

2. \[
\frac{20}{50} = \frac{4}{10} = \frac{2}{5}
\]

\[
\frac{18}{20} = \frac{14}{24} = \\
\frac{3}{30} = \frac{4}{40} = \\
\frac{10}{45} = \frac{2}{6} = \\
\frac{5}{15} = \frac{45}{50} =
\]
Reduce these fractions to their simplest form.

1) \( \frac{10}{20} = \)  
11) \( \frac{50}{100} = \)
21) \( \frac{10}{40} = \)

2) \( \frac{20}{70} = \)
12) \( \frac{30}{40} = \)
22) \( \frac{3}{6} = \)

3) \( \frac{3}{12} = \)
13) \( \frac{18}{24} = \)
23) \( \frac{10}{20} = \)

4) \( \frac{4}{18} = \)
14) \( \frac{2}{12} = \)
24) \( \frac{14}{49} = \)

5) \( \frac{16}{80} = \)
15) \( \frac{5}{35} = \)
25) \( \frac{21}{27} = \)

6) \( \frac{40}{48} = \)
16) \( \frac{21}{35} = \)
26) \( \frac{9}{15} = \)

7) \( \frac{48}{54} = \)
17) \( \frac{12}{18} = \)
27) \( \frac{10}{40} = \)

8) \( \frac{6}{9} = \)
18) \( \frac{7}{14} = \)
28) \( \frac{20}{30} = \)

9) \( \frac{4}{20} = \)
19) \( \frac{35}{40} = \)
29) \( \frac{5}{10} = \)

10) \( \frac{9}{15} = \)
20) \( \frac{21}{30} = \)
30) \( \frac{25}{35} = \)
HOW TO CONVERT A PERCENT TO A FRACTION

The key point when dealing with percentages is to remember that they represent the number of parts out of 100.

To convert a percent to a fraction, follow the steps below:

Step 1) Put your numerator as the percentage and put this over a denominator of 100.

Step 2) Simplify this fraction if required.

You have now changed your percentage to a fraction.

**Example 1:** Convert 35% to a fraction.

To convert the percentage to a fraction, put the numerator as the percentage and the denominator as 100.

\[
35\% = \frac{35}{100}
\]

Next we are going to simplify this fraction by dividing the numerator and denominator by 5.

\[
35 \div 5 = 7; \quad 100 \div 5 = 20
\]

So \(35\% = \frac{35}{100} = \frac{7}{20}\)

**Example 2:** Convert 132% to a fraction

To convert the percentage to a fraction, put the numerator as the percentage and the denominator as 100.

\[
132\% = \frac{132}{100}
\]

Next we are going to simplify this fraction by dividing the numerator and denominator by 4.

\[
132 \div 4 = 33; \quad 100 \div 4 = 25
\]

So \(132\% = \frac{132}{100} = \frac{33}{25}\) or \(1 \frac{8}{25}\)
I can convert between fractions, percentages and decimals.

Convert these percentages to fractions by putting the percentage over a denominator of 100 and then simplifying them to their lowest form.

Leave your answers as an improper fraction if it is greater than 1.

1) $12\% = \frac{12}{100} = \frac{3}{25}$

2) $40\% = \frac{40}{100} = \_\_$

3) $14\% = \_\_\_\_\_\_$

4) $25\% = \_\_\_\_\_\_$

5) $30\% = \_\_\_\_\_\_$

6) $37\% = \_\_\_\_\_\_$

7) $66\% = \_\_\_\_\_\_$

8) $82\% = \_\_\_\_\_\_$

9) $50\% = \_\_\_\_\_\_$

10) $26\% = \_\_\_\_\_\_$

11) $75\% = \_\_\_\_\_\_$

12) $24\% = \_\_\_\_\_\_$

13) $70\% = \_\_\_\_\_\_$

14) $89\% = \_\_\_\_\_\_$

15) $74\% = \_\_\_\_\_\_$

16) $120\% = \_\_\_\_\_\_$

17) $55\% = \_\_\_\_\_\_$

18) $142\% = \_\_\_\_\_\_$

19) $150\% = \_\_\_\_\_\_$

20) $54\% = \_\_\_\_\_\_$

21) $34\% = \_\_\_\_\_\_$

22) $27\% = \_\_\_\_\_\_$

23) $135\% = \_\_\_\_\_\_$

24) $72\% = \_\_\_\_\_\_$

25) $81\% = \_\_\_\_\_\_$

26) $178\% = \_\_\_\_\_\_$

27) $310\% = \_\_\_\_\_\_$

28) $275\% = \_\_\_\_\_\_$

29) $180\% = \_\_\_\_\_\_$

30) $56\% = \_\_\_\_\_\_$

31) $17\% = \_\_\_\_\_\_$

32) $420\% = \_\_\_\_\_\_$

33) $36\% = \_\_\_\_\_\_$

34) $164\% = \_\_\_\_\_\_$

35) $118\% = \_\_\_\_\_\_$
I can convert between fractions, percentages and decimals.

Converting fractions into decimals is a straightforward task if you have a calculator at hand. If you don’t have a calculator, you can convert fractions into decimals by using long division.

To convert a fraction into a decimal, you simply need to divide the numerator by the denominator using a calculator. Your calculator will display this as a decimal answer. If it doesn’t, press the SD button which is just above the DEL button.

Example 1 - Convert $\frac{2}{5}$ to a decimal. $\frac{2}{5} = 2 \div 5 = 0.4$

Example 2 - Convert $\frac{3}{16}$ to a decimal. $\frac{3}{16} = 3 \div 16 = 0.1875$

Convert these fractions into decimals:

1) $\frac{1}{5} = $  
2) $\frac{3}{12} = $  
3) $\frac{3}{8} = $  
4) $\frac{4}{5} = $  

5) $\frac{7}{4} = $  
6) $\frac{7}{16} = $  
7) $\frac{1}{6} = $  
8) $\frac{11}{2} = $  

9) $\frac{18}{8} = $  
10) $\frac{6}{15} = $  
11) $\frac{7}{3} = $  
12) $\frac{6}{20} = $  

13) $\frac{9}{15} = $  
14) $\frac{16}{6} = $  
15) $\frac{7}{9} = $  
16) $\frac{9}{5} = $
I can convert between fractions, percentages and decimals.

To convert a decimal to a fraction, follow these steps:

Step 1) Count the number of decimal places the decimal has.

Step 2) Put a 1 and the number of zeros that there are decimal places for the denominator of the fraction. If you have 2 decimal places, the denominator would be 100. If you have 4 decimal places, the denominator would be 10000.

Step 3) The decimal digits now become the numerator.

Step 4) Optional – you can reduce this fraction to its simplest form.

Example: 0.815

The number of decimal places is 3. The denominator will be 1000. The numerator will be 815.

The fraction will be \( \frac{815}{1000} \)

To find the simplest form divide the numerator and denominator by 5

\[
\frac{815 \div 5}{1000 \div 5} = \frac{163}{200}
\]

Example: 2.36

The number of decimal places is 2. The denominator will be 100. The numerator will be 36.

The fraction will be \( 2 \frac{36}{100} \) or \( \frac{236}{100} \)

To find the simplest form, divide the numerator and denominator by 4

\[
2 \frac{36 \div 4}{100 \div 4} = 2 \frac{9}{25} \quad \text{or} \quad \frac{236 \div 4}{100 \div 4} = \frac{59}{25}
\]
I can convert between fractions, percentages and decimals.

Convert these decimals to fractions.

- Leave your answers with the denominator as a power of 10.
- As an extra challenge, you could simplify the fractions to their lowest terms.
- If the decimal is greater than one, leave your answer as a mixed number.

1) 0.7  =  2) 0.3  =  3) 0.65  =  
4) 0.24  =  5) 0.71  =  6) 0.1  =  
7) 0.03  =  8) 0.127  =  9) 0.91  =  
10) 0.714  =  11) 0.66  =  12) 0.107  =  
13) 1.7  =  14) 3.8  =  15) 14.9  =  
16) 5.75  =  17) 7.94  =  18) 41.5  =  
19) 8.09  =  20) 0.072  =  21) 0.394  =  
22) 9.27  =  23) 1.98  =  24) 0.802  =  

Level of support:

NS  LS  WS  ATL  G  S  W  VF  SA
I can convert between fractions, percentages and decimals.

Convert these decimals to fractions:

- Leave the fraction answers in simplest form by reducing them using common factors.
- If the decimal is greater than one, leave your answer as a mixed fraction.

1) 0.75 =  
2) 0.2 =  
3) 0.35 =  
4) 0.26 =  
5) 0.44 =  
6) 0.68 =  
7) 0.125 =  
8) 0.72 =  
9) 0.67 =  
10) 0.235 =  
11) 0.16 =  
12) 0.375 =  
13) 4.5 =  
14) 6.8 =  
15) 12.6 =  
16) 2.75 =  
17) 4.15 =  
18) 1.07 =  
19) 7.85 =  
20) 0.072 =  
21) 0.54 =  
22) 3.49 =  
23) 2.08 =  
24) 0.875 =  