Lesmahagow High School

Mathematics Department

BGE

DECIMALS

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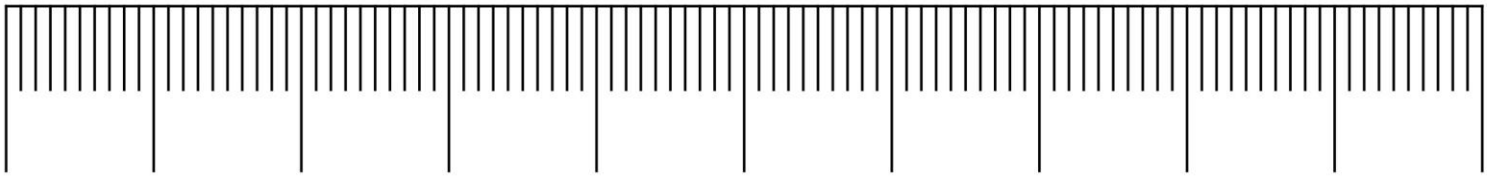
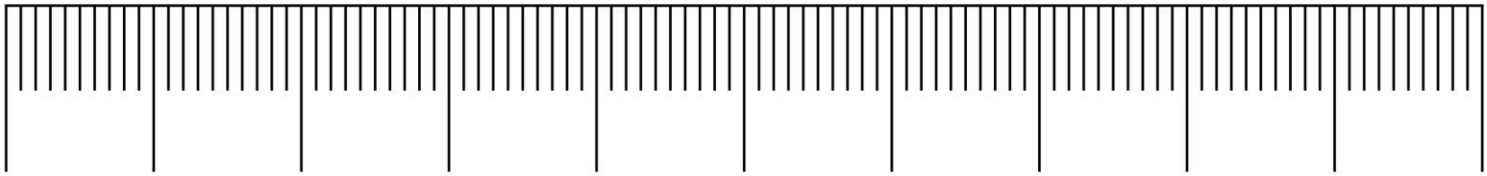
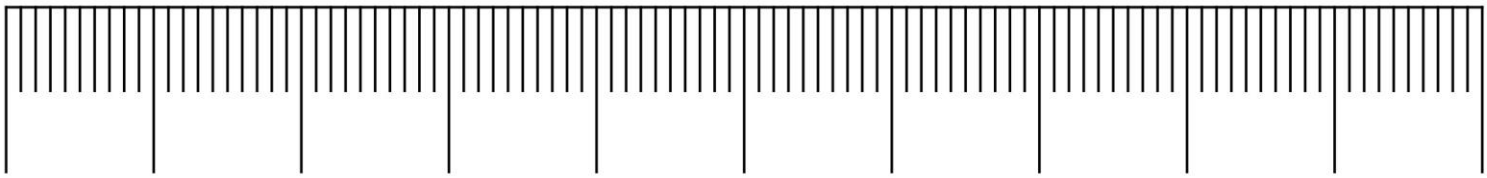
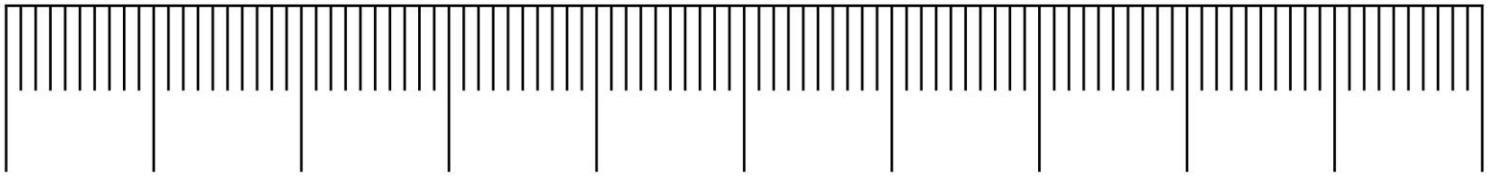
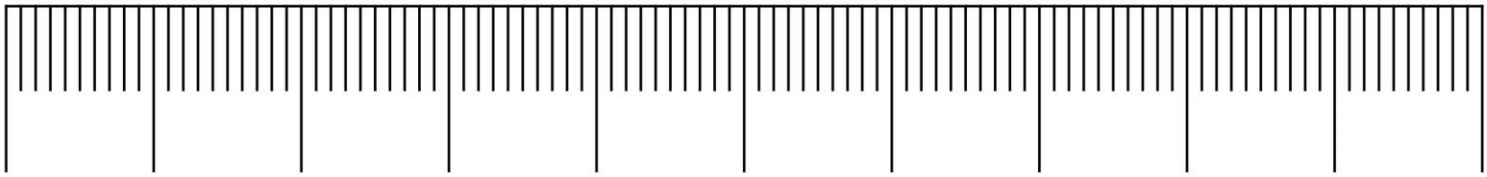
Blank Number lines











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Greater Decimals

Write the Correct Comparison Symbol (>, < or =) in each box

1. 7.82 ☐ 7.9
2. 5.89 ☐ 5.9
3. 0.38 ☐ 0.4
4. 4.67 ☐ 0.467
5. 1.39 ☐ 0.139
6. 0.93 ☐ 0.91
7. 0.34 ☐ 0.034
8. 3.23 ☐ 3.18
9. 0.48 ☐ 0.048
10. 2.38 ☐ 2.41
11. 3 ☐ 3.1
12. 4 ☐ 4
13. 8.34 ☐ 0.834
14. 8.75 ☐ 0.875
15. 0.31 ☐ 0.031
16. 7.23 ☐ 7.25
17. 6.48 ☐ 6.51
18. 1.43 ☐ 1.45
19. 2.37 ☐ 0.237
20. 3.57 ☐ 3.55

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Column Addition with Decimals

Worked Example 1:
Add together 3.25 + 1.54

Worked Example 2:
Add 1. 0935 + 23.49

You must line up the columns vertically, so the decimal points are in a vertical line. The numbers either side of the decimal point will fall into place around the decimal point. Then add as for whole numbers, placing the decimal point in the answer in the same column.

```
 3.25
 1.54
 4.79
```

```
  1.0935
 23.4900
 24.5835
    1
```

Now try these examples:

a.
```
  1.34
+2.65
------
```

b.
```
 23.402
 +5.29
-------
```

c.
```
 205.3
 +0.39
-------
```

d.
```
   2.49
+10.582
-------
```

e.
```
  5.27
+0.985
------
```

f.
```
   2.035
 +68.29
--------
```

Now use column addition to add these numbers:

g. 28.35 + 1.21 =

h. 34.69 + 9.42 =

i. 0.35 + 2.075 =

j. 375.4 + 2.375 + 42 =

k. 496.25 + 5.69 + 0.03 =

l. 30.03 + 109.205 + 2.0032 =

m. 2.35 + 0.09 + 42.005 + 1.302 =

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Column Subtraction with Decimals

Worked Example:

Calculate 439.05 - 569.375

First write down the numbers with the larger number on top and keep the decimal points in a vertical column.

3	13	8	13		9	14	10
~~4~~	~~3~~	~~9~~	~~4~~	.	~~0~~	~~5~~	~~0~~
	5	6	9	.	3	7	5
3	8	2	4	.	6	7	5

Its helpful to add a zero to make the top number 4394.050

The top number is rearranged (decomposed) before subtracting digits, starting from the right hand column.

1.

5	2	1	6	.	4	3
	1	0	4	.	2	2

2.

3	9	5	2	.	7	5
		3	4	1	.	5

3.

	5	9	3	.	4	6	9
		2	2	.	3	4	

4.

7	3	2	5	.	4	3
	6	2	7	.	3	5

5.

	9	2	5	.	4	3	1
		3	0	.	5	9	

6.

	4	3	5	.	2	5	
	1	4	9	.	3	7	5

Now use column subtraction to subtract these numbers:

7. 2957.30 - 936.5

8. 4235.25 - 2349.501

9. 243.6 - 82.675

10. 1140 - 929.125

Decimals Places & Significant figures

Decimal Places

Complete the table by rounding the original number to:

a) 2 decimal places b) 1 decimal place c) a whole number

(Remember to start from the **original** number each time.)

Original number	2 decimal places	1 decimal place	whole number
12.947			
84.3524			
0.765			
104.997			
8.442			

Significant Figures

Complete the table by rounding the original number to:

a) 3 significant figures b) 2 significant figures c) 1 significant figure

(Remember to start from the **original** number each time.)

Original number	3 significant figures	2 significant figures	1 significant figure
2.856			
44.53			
18.29			
532.41			
99.98			

Multiplying Decimals (1 of 2)

Look at this decimal

U	t	h
0 .	0	7

The value of the 7 is $\frac{7}{100}$

$\frac{7}{100}$ is a hundred times smaller than 7

Complete the following:

1. $\frac{5}{100}$ is _____ times smaller than 5
2. $\frac{2}{100}$ is a hundred times smaller than _____
3. $\frac{\square}{100}$ is a hundred times smaller than 8

When you multiply a number by a one-digit number with two decimal places you are multiplying by the digit in the decimal and making the number a hundred times smaller.

Look at these examples:

- $6 \times 4 = 24$
- $6 \times 0.04 = 6 \times 4 \div 100 = 0.24$

OK, turn over and try the calculations.

Multiplying Decimals (2 of 2)

4. 5 × 9 = _____, so 5 × 0.09 = _____

5. 7 × 3 = _____, so 7 × 0.03 = _____

6. 8 × 4 = _____, so 8 × 0.04 = _____

7. 7 × 6 = _____, so 7 × 0.06 = _____

8. 6 × 8 = _____, so 0.06 × 8 = _____

9. 9 × 7 = _____, so 0.09 × 7 = _____

10. 5 × 6 = _____, so 0.05 × 0.6 = _____

Now, try these:

11. 9 × 0.03 = _____

12. 8 × 0.02 = _____

13. 0.09 × 5 = _____

14. 0.04 × 9 = _____

15. 7 x 0.07 = _____

Complete these:

16. 0.07 = _____ ÷ 100

17. 0.02 × 9 = 2 ÷ _____ × 9 = _____

18. 4 × 0.05 = 20 ÷ _____ = _____

19. 8 × 0.07 = 8 × _____ ÷ 100 = _____

20. 0.07 × 5 = 7 × 5 ÷ _____ = _____

Multiplying Decimals : 2dp – B (1 of 2)

Look at this multiplication:

326×4

We can partition 326 into:

$300 + 20 + 6$

Multiplying each number by 4 will give us:

$300 \times 4 = 1200$

$20 \times 4 = 80$

$6 \times 4 = 24$

Adding the two answers will give the answer to 326 × 4:

$1200 + 80 + 24 = 1304$

We can use the same idea to multiply:

326×0.04

Setting this out in a column multiplication will look like this:

$$\begin{array}{rr} & 3\ 2\ 6 \\ \times & 0.0\ 4 \\ \hline \end{array}$$

It might be best to treat this multiplication in two parts:

1. The multiplication of the digits.
2. Where to put the decimal point.

So, We know that multiplying by 0.04 is the same as multiplying by 4 and dividing by 100

$$\begin{array}{rr} & 3\ 2\ 6 \\ \times & \quad\quad 4 \\ \hline 1 & 3\ 0\ 4 \end{array}$$

$1304 \div 100 = 13.04$

$$\begin{array}{rr} & 3\ 2\ 6 \\ \times & 0.0\ 4 \\ \hline 1 & 3.0\ 4 \end{array}$$

Multiplying Decimals : 2dp – B (2 of 2)

Now, try these:

1.
$$\begin{array}{r} 3\ 4\ 2 \\ \times\ 0.0\ 2 \\ \hline \end{array}$$

2.
$$\begin{array}{r} 3\ 1\ 3 \\ \times\ 0.0\ 3 \\ \hline \end{array}$$

3.
$$\begin{array}{r} 2\ 1\ 2 \\ \times\ 0.0\ 4 \\ \hline \end{array}$$

4.
$$\begin{array}{r} 4\ 0\ 2 \\ \times\ 0.0\ 2 \\ \hline \end{array}$$

With these calculations, think about using the carrying figure.

5. 63 × 0.04 =

6. 82 × 0.07 =

7. 241 × 0.09 =

8. 735 × 0.07 =

9. 856 × 0.06 =

10. 4274 × 0.05 =

11. 8206 × 0.07 =

Complete the missing numbers:

12. 289 × 0.06 = _____ × 6 ÷ _____ = _____

13. 7621 × 0.03 = 7621× _____ ÷ _____ = _____

Order of Operations with Decimals

Write your working in the spaces provided and underline you answers.

Silver	Gold
$3 + 2 \times 3$	$1.2 + 2.5 \times 4.0$
$3.0 + 2 \times 3.0$	$2.7 + 3.4 \times (-3)^2$
$5.0 + 3.0 \times 5.0$	$9.6 - (3.1)^2$
$5.4 \times 2 + 2.7 \times 4$	$(-0.9) \times (1.5 + 5.8)$
$1.8 + 2 \times 3.6 + 1.0$	$(7.5)^2 + 1.6$
$3.7 - (1.2 + 1.3)^2$	$(8.9)^2 - (-4.9)$
$1.2 \times 10 - 3.6 \div 100$	$(-1.5) \times (-8.2) - 3.3$
$1.2 \times (1.6 + 3.7)$	$3.9 \times 0.5 + 4.6 \times 3.7$
$3.6 + (2.2 - (-3.6))^2$	$1.33 + (-4.66) \times 1.75^2$

Extension

$(5.9-5.3)\times 7.2+(1.4)^2$

$((2.1)_2+5.2-7.2)\times 7.1$

$8.5\times((1.6)_2+2.4-2.1)$

$(7.9)^2+4.2\times(6.5-5.7)$

$(7.3)^2+9.1\div(8.7-6.1)$

$(3.2)^2\times(1.6-1.4+8.3)$

$(5.2+6.6-9.3)^2\times3.8$

$3.8\times(9.5+(2.5)_2-2.4)$

Extension and Inquiry

Multiply 0.283 by 10, write this down, then multiply this answer by 10, write this down, then by 10 again, write this down. Add you three answers to your starting number. What do you notice about your answer? What's the name for this type of number?

Try this for the following: 0.091, 0.364, 0.475, 0.567, 0.637, 0.465. What do you notice?

Try to make up some of your own.

Target 24

Instructions

1. Choose four numbers
2. Use +, - , x, ÷ and brackets
3. Write calculations to make 24
4. You must use each digit exactly once

Try again for

1. Use the numbers 4, 6, 6, and 8.
2. Write calculations to make 24.
3. You must use each digit only once
4. How many ways can you find?

Try again

1. Make 24 using 1, 2, 3 and 4 exactly once
2. Make 24 using 1, 2, 3 and 5 exactly once
3. Make 24 using 1, 2, 3, and 6 exactly once
4. Make 24 using 1, 2, 3, …..

Bracketing

Put in brackets to make the following true

8 x 5 – 4 + 12 ÷ 2 = 24	does this work for 0.8 x 0.5 – 0.4 +1.2 ÷ 0.2 = 2.4?
8 x 5 – 4 + 12 ÷ 2 = 14	does this work for 0.8 x 0.5 – 0.4 +1.2 ÷ 0.2 = 1.4?
8 x 5 – 4 + 12 ÷ 2 = 42	does this work for 0.08 x 0.05 – 0.04 +0.12 ÷ 0.02 = 0.42?
8 x 5 – 4 + 12 ÷ 2 = -44	…
8 x 5 – 4 + 12 ÷ 2 = 12	…
8 x 5 – 4 + 12 ÷ 2 = 52	…
8 x 5 – 4 + 12 ÷ 2 = 10	…
8 x 5 – 4 + 12 ÷ 2 = 32	…
8 x 5 – 4 + 12 ÷ 2 = -24	…