Foundation Check In - 2.02 Decimal fractions

Do not use a calculator.

Work out the following, showing all your working.

1. $2.4 + 1.07 - 3.5$

2. $1.8 + 6 \times {}^{-}1.8$

3. $\frac{1}{5} + 0.15$
   Give your answer as a decimal.

4. $6.2 \div 0.02$

5. Express 0.044 as a fraction in its simplest form.

6. Show that $\frac{5}{12} = 0.41666\ldots$.

7. Chris bought 5 pens and paid £2.
   He worked out the cost of a pen as $2 \div 5$ and gave the answer as 0.4p each.
   Explain what is wrong with his answer.

8. On each of 5 days, the midnight temperatures in a town were -1.3°C, 2°C, -2.5°C, 0.8°C and 1.4°C. Show that the average temperature is 0.08°C.

9. Jenna buys 3 pens and 2 erasers. She pays with a £5 note and receives 25p change.
   Each pen cost 2.5 times as much as an eraser.
   Find the cost of a pen and the cost of an eraser.

10. Find the area of the triangle with the vertices plotted on a one centimetre coordinate grid at (-1.2, 0), (3.1, 0) and (2.4, 1.4).

Extension (You are allowed to use a calculator)

Use each of the digits 0, 2, and 5 **once only** and no other digits to write two numbers A and B where both A and B are greater than 0. For example $A = [0].05$ and $B = 2$.
(NB: The zero to the left of the decimal point does not count.)

The answer to $A \div B$ must be as small as possible.

Find A and B and show that this gives the smallest possible answer.

Explain the method you used to answer this problem and then apply this method to some other digits.

Answers

1. $^{-}0.03$
2. $^{-}9$
3. 0.35
4. 310
5. $\frac{11}{250}$
6. $12\overline{)5.^{5}0^{2}0^{8}0^{8}0}$ $\quad 0.4166...$
7. The answer is £0.40 or 40p. Chris has stated the units incorrectly.
8. $\frac{^{-}1.3+2+^{-}2.5+0.8+1.4}{5}=\frac{0.4}{5}=0.08\,^{\circ}\text{C}$
9. Eraser 50p, pen £1.25
10. $\frac{1}{2}\times(3.1-^{-}1.2)\times 1.4=3.01\text{cm}^2$

Extension

$[0].2\div 50=0.004$

$[0].2\div 5.0=0.04$

$2\div 5.0=0.4$

$[0].2\div[0].05=4$

$[0].05\div 2=0.025$

So $A=[0].2$ and $B=50$ gives the smallest answer to $A\div B$

Method: Make the first number as small as possible and the second number as large as possible. With 4, 5 and 7 the numbers would be $[0].4\div 75=0.0053...$

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Assessment Objective	Qu.	Topic	R	A	G
AO1	1	Add and subtract decimals			
AO1	2	Use order of operations when calculating with decimals, including negative decimals			
AO1	3	Add a fraction to a decimal			
AO1	4	Divide a decimal by a decimal			
AO1	5	Express a terminating decimal as a fraction			
AO2	6	Use division to convert a simple fraction to a decimal			
AO2	7	Use place value when calculating with monetary decimal values			
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