Calculations with Recurring Decimals

(a) Using algebra, show that

$$0.\dot{2} + 0.\dot{2}\dot{3} = \frac{5}{11}$$

(b) Using algebra, show that

$$1.3\dot{8}\dot{1} - 0.\dot{8}\dot{1} = \frac{31}{55}$$

(a) Using algebra, show that

$$0.\dot{5} \times 0.\dot{5}\dot{4} = \frac{10}{33}$$

(b) Using algebra, show that

$$4 \times 0.85\dot{5} \times 0.\dot{1}\dot{5} = \frac{14}{27}$$

(a) Using algebra, show that

$$0.\dot{7} \div 0.2\dot{1} = 3\frac{13}{19}$$

(b) Using algebra, show that

$$0.35\dot{5} \div 1.2\dot{7} = \frac{32}{115}$$

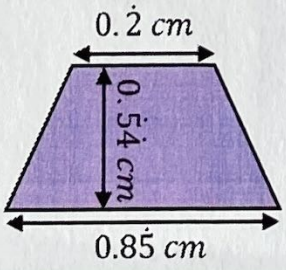
(a) Show that the mean of the three numbers

$$0.\dot{8}, 0.8\dot{1} \text{ and } 0.\dot{8}\dot{1}$$

can be written in its simplest form as a fraction $\frac{a}{b}$, where a and b are integers to be found.

(b) Using algebra, prove that the area of the trapezium shown is

$$\frac{97}{330}\ cm^2$$



(a) $9x = 2 \quad x = \frac{2}{9}$

$99y = 23 \quad y = \frac{23}{99}$

$\frac{2}{9} + \frac{23}{99} = \frac{22+23}{99} = \frac{45}{99} = \frac{5}{11}$

(b) $990x = 1368 \quad x = \frac{76}{55}$

$99y = 81 \quad y = \frac{9}{11}$

$\frac{76}{55} - \frac{9}{11} = \frac{76-45}{55} = \frac{31}{55}$

(a) $9x = 5 \quad x = \frac{5}{9} \quad 99y = 54 \quad y = \frac{54}{99}$

$\frac{5}{9} \times \frac{54}{99} = \frac{270}{891} = \frac{10}{33}$

(b) $90x = 77 \quad x = \frac{77}{90}$

$99y = 15 \quad y = \frac{15}{99} \quad 4 \times \frac{77}{90} \times \frac{15}{99} = \frac{4620}{8910} = \frac{14}{27}$

(a) $9x = 7 \quad x = \frac{7}{9}$

$90y = 19 \quad y = \frac{19}{90}$

$\frac{7}{9} \div \frac{19}{90} = \frac{7}{9} \times \frac{90}{19} = \frac{630}{171} = \frac{70}{19} = 3\frac{13}{19}$

(b) $90x = 32 \quad x = \frac{32}{90}$

$90y = 115 \quad y = \frac{115}{90}$

$\frac{32}{90} \div \frac{115}{90} = \frac{32}{115}$

(a) $x = \frac{8}{9} \quad y = \frac{73}{90} \quad z = \frac{81}{99}$

$\frac{8}{9} + \frac{73}{90} + \frac{81}{99} = \frac{880+803+810}{990} = \frac{2493}{990}$

$\frac{2493}{990} \div 3 = \frac{2493}{2970} = \frac{277}{330}$

$a = 277 \quad b = 330$

(b) $\frac{2}{9} + \frac{77}{90} = \frac{97}{90}$

$\frac{97}{90} \div 2 = \frac{97}{180} \quad A = \frac{97}{180} \times \frac{54}{99}$

$A = \frac{5238}{17820} = \frac{97}{330}$