

4.6 Answers

GCSE Mathematics Iteration

4.6.1 Solutions to 4.2 Examples #1

$$\begin{array}{ll} \text{(i)} & \frac{3}{7} \times \frac{4}{5} = \frac{12}{35} \\ \text{(ii)} & \frac{5}{12} \times \frac{4}{7} = \frac{5}{3} \times \frac{1}{7} = \frac{5}{21} \\ \text{(iii)} & \frac{4}{7} \times 2 = \frac{8}{7} \\ \text{(iv)} & \frac{12}{13} \times 13 = 12 \end{array}$$

[4 marks]

4.6.2 Solutions to 4.3 Examples #2

$$\begin{array}{ll} \text{(i)} & 12 \left(\frac{1}{4} + 2 \right) \\ & = 3 + 24 \\ & = 27 \\ \text{(ii)} & \left(\frac{4}{5} + \frac{1}{3} \right) \times 15 \\ & = 12 + 5 \\ & = 17 \\ \text{(iii)} & 8 \left(2 + \frac{3}{8} \right) \\ & = 16 + 3 \\ & = 19 \\ \text{(iv)} & \left(\frac{3}{5} + 2 \right) \times 5 \\ & = 3 + 10 \\ & = 13 \end{array}$$

[4 marks]

4.6.3 Solution to 4.4 An Iteration Involving Fractions

$$U_1 = \frac{3}{5} \quad U_{n+1} = \frac{1}{2} U_n$$

U_1	U_2	U_3	U_4	U_5	U_6
$\frac{3}{5}$	$\frac{3}{10}$	$\frac{3}{20}$	$\frac{3}{40}$	$\frac{3}{80}$	$\frac{3}{160}$

[4 marks]

4.6.4 Solutions to 4.5 Exercise

Answer 1

$$\begin{array}{ll} \text{(i)} & \frac{3}{11} \times \frac{5}{7} = \frac{15}{77} \\ \text{(ii)} & \frac{4}{9} \times \frac{3}{5} = \frac{4}{3} \times \frac{1}{5} = \frac{4}{15} \\ \text{(iii)} & \frac{5}{13} \times 2 = \frac{10}{13} \\ \text{(iv)} & \frac{10}{17} \times 17 = 10 \end{array}$$

[4 marks]

Answer 2

$$\begin{aligned} \text{(i)} \quad 15\left(\frac{1}{5} + 2\right) \\ &= 3 + 30 \\ &= 33 \end{aligned}$$

$$\begin{aligned} \text{(ii)} \quad \left(\frac{3}{4} + \frac{1}{6}\right) \times 12 \\ &= 9 + 2 \\ &= 11 \end{aligned}$$

$$\begin{aligned} \text{(iii)} \quad 7\left(3 + \frac{4}{7}\right) \\ &= 21 + 4 \\ &= 25 \end{aligned}$$

$$\begin{aligned} \text{(iv)} \quad \left(\frac{5}{6} + 2\right) \times 6 \\ &= 5 + 12 \\ &= 17 \end{aligned}$$

[4 marks]**Answer 3**

$$\begin{aligned} \text{(i)} \quad \frac{2}{3}\left(2 + \frac{1}{2}\right) \\ &= \frac{4}{3} + \frac{1}{3} \\ &= \frac{5}{3} \end{aligned}$$

$$\begin{aligned} \text{(ii)} \quad \frac{3}{5}\left(\frac{4}{3} + 3\right) \\ &= \frac{4}{5} + \frac{9}{5} \\ &= \frac{13}{5} \end{aligned}$$

[4 marks]**Answer 4**

$$A_1 = \frac{1}{2} \quad A_{n+1} = \frac{1}{2} A_n$$

A_1	A_2	A_3	A_4	A_5	A_6
$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{16}$	$\frac{1}{32}$	$\frac{1}{64}$

[6 marks]**Answer 5**

$$B_1 = \frac{16}{81} \quad B_{n+1} = \frac{3}{2} B_n$$

B_1	B_2	B_3	B_4	B_5	B_6	B_7	B_8
$\frac{16}{81}$	$\frac{8}{27}$	$\frac{4}{9}$	$\frac{2}{3}$	$\frac{1}{1}$	$\frac{3}{2}$	$\frac{9}{4}$	$\frac{27}{8}$

[6 marks]**Answer 6**

$$\text{(i)} \quad 3\left(2 + \frac{1}{3}\right) = 6 + 1 = 7$$

[2 marks]

$$\text{(ii)} \quad \frac{3}{3} \times \frac{\left(2 + \frac{1}{3}\right)}{1} = \frac{6 + 1}{3} = \frac{7}{3}$$

[2 marks]

Answer 7

$$(i) \quad 5\left(3 + \frac{2}{5}\right) = 15 + 2 = 17$$

[2 marks]

$$(ii) \quad \frac{5}{5} \times \frac{\left(3 + \frac{2}{5}\right)}{1} = \frac{15 + 2}{5} = \frac{17}{5}$$

[2 marks]

Answer 8

$$(i) \quad \left(2 + \frac{3}{7}\right) \times 7 = 14 + 3 = 17$$

[2 marks]

$$(ii) \quad \frac{\left(2 + \frac{3}{7}\right)}{1} \times \frac{7}{7} = \frac{14 + 3}{7} = \frac{17}{7}$$

[2 marks]

Answer 9

$$\frac{\left(4 + \frac{3}{5}\right)}{1} \times \frac{5}{5} = \frac{20 + 3}{5} = \frac{23}{5}$$

[4 marks]

Answer 10

$$\frac{\left(3 + \frac{4}{7}\right)}{1} \times \frac{7}{7} = \frac{21 + 4}{7} = \frac{25}{7}$$

[4 marks]

Answer 11

$$G_1 = \frac{1}{4} \quad G_{n+1} = \frac{2}{3} G_n$$

G_1	G_2	G_3	G_4	G_5	G_6
$\frac{1}{4}$	$\frac{1}{6}$	$\frac{1}{9}$	$\frac{2}{27}$	$\frac{4}{81}$	$\frac{8}{243}$

[6 marks]