

Math 4a HW 7

#1.

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

#2. $4 \cdot 7 = 28$. $\left(4 : \frac{1}{7} = 4 \cdot 7 = 28 \right)$.

#3. $10 : 2.5 = 25$ $\left(10 : \frac{5}{2} = 10 \cdot \frac{2}{5} = 25 \right)$.

#4.

1. $12 \cdot 10 = 120$ seats altogether,

2. $120 : 5 \cdot 4 = 120 \cdot \frac{4}{5} = 96.$

#5.

a. $\frac{1}{3} \cdot \frac{2}{7} = \frac{2 \cdot 1}{3 \cdot 7} = \frac{2}{21}$

b. $\frac{1}{2} \cdot \frac{5}{6} = \frac{1 \cdot 5}{2 \cdot 6} = \frac{5}{12}$

c. $\frac{1}{2} \cdot \frac{1}{3} = \frac{1 \cdot 1}{2 \cdot 3} = \frac{1}{6}.$

d. $\frac{3}{5} \cdot \frac{1}{2} \cdot \frac{4}{9} = \frac{3 \cdot 1 \cdot 4}{5 \cdot 2 \cdot 9} = \frac{\cancel{3} \cdot 1 \cdot 2 \cdot \cancel{2}}{5 \cdot \cancel{2} \cdot 3 \cdot \cancel{3}} = \frac{2}{15}$

e. $\frac{1}{2} \cdot \frac{2}{3} \cdot \frac{3}{4} \cdot \frac{4}{5} = \frac{1 \cdot \cancel{2} \cdot \cancel{3} \cdot 4}{\cancel{2} \cdot 3 \cdot \cancel{4} \cdot 5} = \frac{1}{5}.$

f. $\frac{1}{\cancel{2}} \cdot \frac{\cancel{2}}{3} \cdot \frac{\cancel{3}}{4} \cdot \frac{\cancel{4}}{5} \dots \frac{\cancel{23}}{24} \cdot \frac{\cancel{24}}{25} = \frac{1}{25}$

#6.

$$\begin{aligned} \text{a. } \frac{14}{15} \cdot \frac{10}{49} + 5\frac{3}{7} &= \frac{14 \cdot 10}{15 \cdot 49} + 5\frac{3}{7} = \\ &= \frac{\cancel{7} \cdot 2 \cdot \cancel{2} \cdot \cancel{5}}{\cancel{5} \cdot 3 \cdot \cancel{7} \cdot 7} + 5\frac{3}{7} = \frac{4}{21} + 5 + \frac{3}{7} = 5 + \frac{9}{21} + \frac{4}{21} = 5\frac{13}{21} \end{aligned}$$

$$\text{b. } 1\frac{3}{11} - \frac{27}{44} \cdot \frac{4}{9} = 1\frac{3}{11} - \frac{3 \cdot \cancel{9} \cdot \cancel{4}}{\cancel{4} \cdot 11 \cdot \cancel{9}} = 1\frac{3}{11} - \frac{3}{11} = 1.$$

$$\text{c. } 1\frac{2}{3} + \frac{14}{15} \cdot \frac{5}{7} = 1\frac{2}{3} + \frac{\cancel{7} \cdot \cancel{2} \cdot \cancel{5}}{3 \cdot \cancel{5} \cdot \cancel{7}} = 1\frac{2}{3} + \frac{2}{3} = 1 + \frac{4}{3} = 1 + 1 + \frac{1}{3} = 2\frac{1}{3}.$$

$$\begin{array}{l} \#7. \quad \text{d d d d} \quad \text{g g g g g} \rightarrow 4100 \text{ g} \\ \quad \text{d d d d d} \quad \text{g g g g} \rightarrow 4000 \text{ g} \end{array}$$

$$\begin{array}{l} \text{d d d d d} \quad \text{g g g g g} \\ \text{d d d d} \quad \text{g g g g} \end{array} \rightarrow 8100 \text{ g}.$$

9 pairs of d and g are 8100g.

So one d and one g together are 900g

$\begin{matrix} d & d & d & d & d \\ g & g & g & g & g \end{matrix} \rightarrow 4000$

900g, 900g, 900g, 900g and one d is 4000g.

$$3 \cdot 900 = 3600g.$$

$$4000 - 3600 = 400g.$$

One duckling is 400g. One goose is $900 - 400 = 500g$.

(Or we can write equations:

$$4d + 5g = 4100$$

$$5d + 5g = 4000.$$

$$4d + 5d + 4g + 5g = 8100g.$$

$$9d + 9g = 8100$$

$$d + g = 900g.$$

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8.

