# Connecting Selected Response to Constructed Response

**1) Select Yes or No to indicate whether each of these expressions is equivalent to:**

$$\frac{3}{4} \div \frac{1}{8}$$

**A)** $\frac{3 \bullet 8}{4 \bullet 1}$ ◯Yes ◯No

**B)** $\frac{3 \bullet 1}{4 \bullet 8}$ ◯Yes ◯No

**C)** $\frac{3 \div 1}{4 \div 8}$ ◯Yes ◯No

**D)** $\frac{6 \div 1}{8 \div 8}$ ◯Yes ◯No

**2) Find the quotient using three different methods.**

**3) Prove that your answer is correct in two different ways.**

**Divide $\frac{3}{4} \div \frac{1}{8}$ using three different methods:**

| **Description of method:** | **Description of method:** | **Description of method:** |
| --- | --- | --- |
| | | |

**Prove that:** $\frac{3}{4} \div \frac{1}{8} = 6$

**Divide $\frac{3}{4} \div \frac{1}{8}$ using three different methods:**

**Description of method:**

Traditional method. change division to multiplication and multiply by the reciprocal.

$$\frac{3}{4} \div \frac{1}{8}$$
$$= \frac{3}{4} \bullet \frac{8}{1}$$
$$= \frac{3 \bullet 8}{4 \bullet 1}$$
$$= \frac{3 \bullet 4 \bullet 2}{4 \bullet 1}$$
$$= \frac{6}{1}$$
$$= 6$$

**Description of method:**

divide numerators and divide denominators.

$$\frac{3}{4} \div \frac{1}{8}$$
$$= \frac{3 \div 1}{4 \div 8}$$
$$= \frac{3}{0.5}$$
$$= \frac{3}{0.5} \bullet \frac{10}{10}$$
$$= \frac{30}{5}$$
$$= 6$$

**Description of method:**

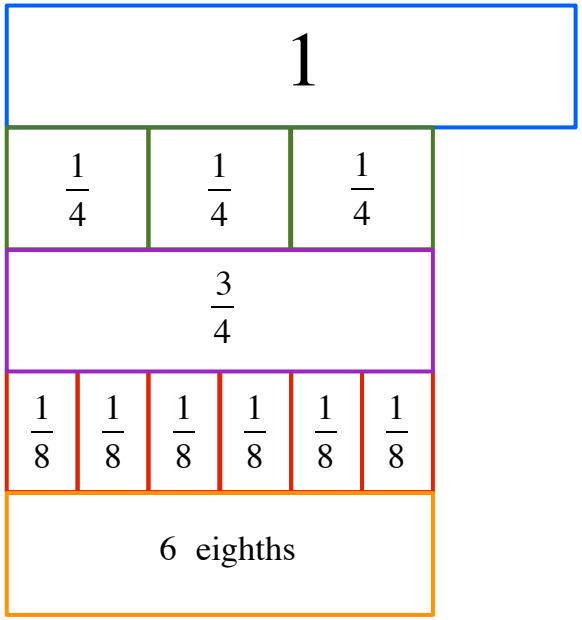
get common denominators and then divide numerators and divide denominators.

$$\frac{3}{4} \div \frac{1}{8}$$
$$= \frac{3}{4} \bullet \frac{2}{2} \div \frac{1}{8}$$
$$= \frac{6}{8} \div \frac{1}{8}$$
$$= \frac{6 \div 1}{8 \div 8}$$
$$= \frac{6}{1}$$
$$= 6$$

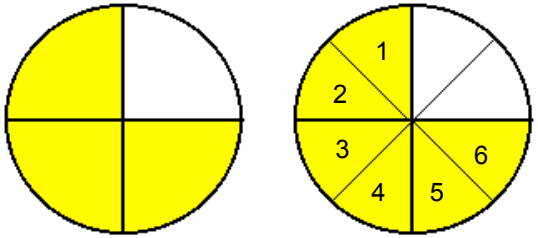
**Prove that:** $\frac{3}{4} \div \frac{1}{8} = 6$

We know division means to "give out" equally or group equally. For example, $6 \div 3 = 2$ means that if I had 6 candies and 3 friends, I could "give out" 2 pieces of candy to each of the 3 friends. It could also mean that there are two groups of three in six. So, $\frac{3}{4} \div \frac{1}{8}$ is really asking how many eighths there are in three-fourths. I can show (prove) this with pictures and numerically.

## Visual proof #1




## Visual proof #2




$$\frac{3}{4} = \frac{6}{8}$$

## Numerical proof:

Just like you can show that $6 \div 3 = 2$ by using multiplication $2 \bullet 3 = 6$, I will show that $\frac{3}{4} \div \frac{1}{8} = 6$ by showing that $6 \bullet \frac{1}{8} = \frac{3}{4}$.

$$6 \bullet \frac{1}{8}$$
$$= \frac{6}{1} \bullet \frac{1}{8}$$
$$= \frac{6}{8}$$
$$= \frac{2 \bullet 3}{2 \bullet 4}$$
$$= \frac{3}{4}$$

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