

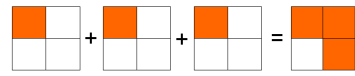
5.6 Multiplying Fractions by Whole Numbers

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Recall that multiplication by a whole number can be represented as repeated addition. For example, $4 \cdot 5 = 5 + 5 + 5 + 5$. You can multiply a whole number by a fraction using the same method.

$$3 \cdot \frac{1}{4} = \frac{1}{4} + \frac{1}{4} + \frac{1}{4} = \frac{3}{4}$$



There is another way to multiply with fractions. Remember that a whole number can be written as an improper fraction with 1 in the denominator. So $3 = \frac{3}{1}$.

$$\frac{3}{1} \cdot \frac{1}{4} = \frac{3 \cdot 1}{1 \cdot 4} = \frac{3}{4}$$

← Multiply numerators
← Multiply denominators

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Multiply. Write each answer in simplest form.

$$7 \cdot \frac{1}{9}$$

$$\frac{7}{1} \cdot \frac{1}{9} = \frac{7}{9}$$

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Multiply. Write each answer in simplest form.

$$6 \cdot \frac{1}{8} \quad \frac{3\cancel{6}}{1} \cdot \frac{1}{\cancel{8}4} = \frac{3}{4}$$

shortcut: cross cancel

$$8 \cdot \frac{2}{3}$$

$$\frac{8}{1} \cdot \frac{2}{3} = \frac{16}{3}$$

$$\frac{16}{3} = 5\frac{1}{3}$$

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Multiply. Write each answer in simplest form.

$$\frac{\cancel{3}^1}{1} \cdot \frac{1}{\cancel{6}_2} = \frac{1}{2}$$

$$\frac{4}{1} \cdot \frac{1}{5} = \frac{4}{5}$$

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Multiply. Write each answer in simplest form.

$$\frac{9}{1} \cdot \frac{3}{4} = \frac{27}{4}$$

$$\frac{27}{4} = 6\frac{3}{4}$$

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Evaluate $4x$ for each value of x . Write each answer in simplest form.

$4x$ - times

$x = \frac{1}{10}$

$$\frac{2\cancel{4}}{1} \cdot \frac{1}{\cancel{10}_5} = \frac{2}{5}$$

$x = \frac{3}{8}$

$$\frac{\cancel{12}_4}{1} \cdot \frac{3}{\cancel{8}_2} = \frac{3}{2} = 1\frac{1}{2}$$

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Evaluate $3x$ for each value of x . Write each answer in simplest form.

$3x$

$x = \frac{1}{9}$

$$\frac{\cancel{3}_1}{1} \cdot \frac{1}{\cancel{9}_3} = \frac{1}{3}$$

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Evaluate $3x$ for each value of x . Write each answer in simplest form.

$x = \frac{4}{7}$

$$\frac{3}{1} \cdot \frac{4}{7} = \frac{12}{7}$$

$$\frac{15}{7}$$

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There are 25 students in the music club. Of those students, $\frac{3}{5}$ are also in the band. How many music club students are in the band?

To find $\frac{3}{5}$ of 25, multiply.

$\frac{3}{5}$ of 25

$$\frac{3}{5} \cdot \frac{25}{1} = 15 \text{ Students}$$

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There are 18 saltwater fish in the aquarium. Of those fish, $\frac{2}{3}$ are blue. How many fish in the aquarium are blue?

To find $\frac{2}{3}$ of 18, multiply.

$\frac{2}{3}$ of 18

$$\frac{2}{3} \cdot \frac{18}{1} = 12 \text{ fish}$$

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