

# Rational Expressions Worksheet

Simplify each expression

1  $\frac{5p^2 - 5p}{1 - p}$

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2  $\frac{45}{10q - 10}$

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3  $\frac{15y - 3}{24}$

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4  $\frac{4s - 4}{6s - 20}$

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Simplify each expression and state the excluded values

5  $\frac{10x - 6}{10x - 6}$

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6  $\frac{2x^2 + 10x}{3x^2 + 15x}$

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7  $\frac{p^2 - 3p - 10}{p^2 + p - 2}$

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8  $\frac{l^2 + l - 6}{l^2 + 8l + 15}$

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## Answers

$$\begin{aligned} \boxed{1} \quad & \frac{5p^2 - 5p}{1 - p} \\ &= \frac{5p(p - 1)}{1 - p} \\ &= \underline{-5p} \end{aligned}$$

$$\begin{aligned} \boxed{2} \quad & \frac{45}{10q - 10} \\ &= \frac{5 \times 9}{10(q - 1)} \\ &= \underline{\frac{9}{2(q - 1)}} \end{aligned}$$

$$\begin{aligned} \boxed{3} \quad & \frac{15y - 3}{24} \\ &= \frac{3(5y - 1)}{24} \\ &= \underline{\frac{5y - 1}{8}} \end{aligned}$$

$$\begin{aligned} \boxed{4} \quad & \frac{4s - 4}{6s - 20} \\ &= \frac{4(s - 1)}{2(3s - 10)} \\ &= \underline{\frac{2(s - 1)}{3s - 10}} \end{aligned}$$

$$\begin{aligned} \boxed{5} \quad & \frac{10x - 6}{10x - 6} \\ &= \frac{10x - 6}{10x - 6} = 1; \quad \begin{array}{l} 10x - 6 = 0 \\ \Rightarrow x = \frac{3}{5} \end{array} \\ & \underline{1; \left\{ \frac{3}{5} \right\}} \end{aligned}$$

$$\begin{aligned} \boxed{6} \quad & \frac{2x^2 + 10x}{3x^2 + 15x} \\ &= \frac{2x(x + 5)}{3x(x + 5)} = \frac{2}{3}; \quad \begin{array}{l} 3x^2 + 15x = 0 \\ \Rightarrow x = \{0, -5\} \end{array} \\ & \underline{\frac{2}{3}; \{0, -5\}} \end{aligned}$$

$$\begin{aligned} \boxed{7} \quad & \frac{p^2 - 3p - 10}{p^2 + p - 2} \\ &= \frac{p^2 - 5p + 2p - 10}{p^2 + 2p - p - 2}; \quad \begin{array}{l} p^2 + p - 2 = 0 \\ \Rightarrow (p + 2)(p - 1) = 0 \\ \Rightarrow p = \{-2, 1\} \end{array} \\ &= \frac{p(p - 5) + 2(p - 5)}{p(p + 2) + 1(p + 2)} \\ & \underline{\frac{p - 5}{(p + 1)}; \{-2, 1\}} \end{aligned}$$

$$\begin{aligned} \boxed{8} \quad & \frac{l^2 + l - 6}{l^2 + 8l + 15} \\ &= \frac{l^2 + 3l - 2l - 6}{l^2 + 5l + 3l + 15}; \quad \begin{array}{l} l^2 + 8l + 15 = 0 \\ \Rightarrow (l + 5)(l + 3) = 0 \\ \Rightarrow l = \{-3, -5\} \end{array} \\ &= \frac{l(l + 3) - 2(l + 3)}{l(l + 5) + 3(l + 5)} \\ & \underline{\frac{l - 2}{l + 5}}; \{-3, -5\} \end{aligned}$$