

Simplify each and state the excluded values.

1) $\frac{20x^2 + 50x}{20x}$

$\frac{2x + 5}{2}; \{0\}$

3) $\frac{3m^2 + 23m + 14}{2m^2 + 11m - 21}$

$\frac{3m + 2}{2m - 3}; \left\{\frac{3}{2}, -7\right\}$

2) $\frac{n + 2}{n^2 + 6n + 8}$

$\frac{1}{n + 4}; \{-4, -2\}$

4) $\frac{49n - 14}{35n - 28}$

$\frac{7n - 2}{5n - 4}; \left\{\frac{4}{5}\right\}$

Simplify each expression.

5) $\frac{n^2 - n - 72}{n^2 - 17n + 72} \cdot \frac{8}{n + 8}$

$\frac{8}{n - 8}$

7) $\frac{b + 2}{8} \div \frac{b^2 + 8b + 12}{b^2 + 11b + 30}$

$\frac{b + 5}{8}$

9) $\frac{25r^2 + 40r}{15r^2 + 24r} \div \frac{r - 7}{3r}$

$\frac{5r}{r - 7}$

11) $\frac{1}{x^2 - 49} \div \frac{7x + 1}{7x^2 - 6x - 1}$

$\frac{x - 1}{(x - 7)(x + 7)}$

13) $\frac{4x - 8}{5} \div \frac{20x - 36}{25x - 45}$

$x - 2$

15) $\frac{x + 1}{2(x + 1)} + \frac{2}{4}$

1

6) $\frac{7r^2}{r^2 + 2r - 24} \cdot \frac{10}{7r^2}$

$\frac{10}{(r - 4)(r + 6)}$

8) $\frac{p + 6}{6} \cdot \frac{6p + 54}{p + 9}$

$p + 6$

10) $5n \cdot \frac{2}{5n^2 - 30n}$

$\frac{2}{n - 6}$

12) $\frac{9}{9m - 90} \div \frac{1}{9m}$

$\frac{9m}{m - 10}$

14) $\frac{25a + 5}{15a + 15} \div \frac{5a^2 - 9a - 2}{3a^2 - 12a - 15}$

$\frac{a - 5}{a - 2}$

16) $\frac{2}{p - 6} + \frac{3p}{2(p + 1)}$

$\frac{-14p + 4 + 3p^2}{2(p - 6)(p + 1)}$

$$17) \frac{3}{k+2} - \frac{6}{3(k-2)}$$

$$\frac{k-10}{(k-2)(k+2)}$$

$$19) \frac{2}{k+1} + \frac{7}{3k+6}$$

$$\frac{13k+19}{3(k+2)(k+1)}$$

$$21) \frac{\frac{4m}{m+1} - \frac{16}{m+1}}{m+1}$$

$$\frac{16}{64m-256}$$

$$\frac{16}{m^2+2m+1}$$

$$23) \frac{\frac{4}{u-3} - \frac{u-3}{u}}{\frac{u-3}{5} + \frac{u}{5}}$$

$$\frac{-5u^2+50u-45}{2u^3-9u^2+9u}$$

$$18) \frac{6n}{2} + \frac{n+7}{12n+8}$$

$$\frac{36n^2+25n+7}{4(3n+2)}$$

$$20) \frac{\frac{1}{5} + \frac{m}{3m+1}}{\frac{1}{m}}$$

$$\frac{8m^2+m}{15m+5}$$

$$22) \frac{\frac{x-3}{3} - \frac{3}{x-2}}{x-3}$$

$$\frac{-x^3+8x^2-21x+18}{3}$$

$$24) \frac{\frac{16}{a} - \frac{a}{4}}{\frac{1}{5} + \frac{15}{a^2}}$$

$$\frac{320a-5a^3}{4a^2+300}$$

Solve each equation. Remember to check for extraneous solutions.

$$25) \frac{1}{k} = \frac{5}{k^2} - \frac{2k+1}{k^2}$$

$$\left\{ \frac{4}{3} \right\}$$

$$26) \frac{2}{b^2+b} + \frac{b+4}{b} = 1$$

$$\left\{ -\frac{3}{2} \right\}$$

$$27) \frac{x+5}{x^2-6x} + \frac{1}{x^2-6x} = \frac{x-1}{x}$$

$$\{8\}$$

$$28) \frac{3}{n-6} = \frac{1}{n-6} - \frac{1}{n-5}$$

$$\left\{ \frac{16}{3} \right\}$$

$$29) \frac{1}{2m^3-10m^2} + \frac{4m^2+5m+1}{2m^3-10m^2} = \frac{1}{m^3-5m^2}$$

$$\left\{ -\frac{5}{4} \right\}$$

$$30) \frac{2n-6}{n^2-n} = \frac{n+1}{3n-3} - \frac{n^2-2n-15}{3n^2-3n}$$

$$\{11\}$$