

Simplifying Rational Expressions Assignment

Simplify the following rational expressions.

1. $\frac{60x^2}{72x^3}$

2. $\frac{20a^{15}}{4a^6}$

3. $\frac{3a-3}{-ra+r}$

4. $\frac{3m+6}{m^2-4}$

5. $\frac{x^2-1}{2x+2}$

6. $\frac{2y-8}{7y-28}$

7. $\frac{x+2}{x^2+3x+2}$

8. $\frac{c^2+2c-8}{3c^2-4c-4}$

9. $\frac{x^2-y^2}{x-y}$

10. $\frac{40t-25}{20}$

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11.
$$\frac{5a^2b+5a^2c}{15ab+15ac}$$

12.
$$\frac{2bc+2bd}{6b^2}$$

13.
$$\frac{y-1}{y^2-1}$$

14.
$$\frac{x^2-9}{x^2+x-6}$$

15.
$$\frac{125a^3b-5a^4}{a-25b}$$

16.
$$\frac{x^2-16}{x^2-8x+16}$$

17.
$$\frac{4-x^2}{x^2-5x+6}$$

18.
$$\frac{2x^2-6x}{3x-x^2}$$

19.
$$\frac{5r^2-15r+2r-6}{r-3}$$

20.
$$\frac{x^3-x^2-x+1}{x^2-2x+1}$$

Simplifying Rational Expressions Assignment

Answer:

Simplify the following rational expressions.

1. $\frac{60x^2}{72x^3}$

Solution:

$$\frac{60x^2}{72x^3} = \frac{\cancel{(12x^2)}(5)}{\cancel{(12x^2)}(6x)} = \frac{5}{6x}$$

2. $\frac{20a^{15}}{4a^6}$

Solution:

$$\frac{20a^{15}}{4a^6} = \frac{(5a^9)(4a^6)}{4a^6} = 5a^9$$

3. $\frac{3a-3}{-ra+r}$

Solution:

$$\frac{3a-3}{-ra+r} = \frac{3(\cancel{a}-1)}{-r(\cancel{a}-1)} = -\frac{3}{r}$$

4. $\frac{3m+6}{m^2-4}$

Solution:

$$\frac{3m+6}{m^2-4} = \frac{3(\cancel{m}+2)}{(\cancel{m}+2)(m-2)} = \frac{3}{m-2}$$

5. $\frac{x^2-1}{2x+2}$

Solution:

$$\frac{x^2-1}{2x+2} = \frac{(\cancel{x}+1)(x-1)}{2(\cancel{x}+1)} = \frac{x-1}{2}$$

6. $\frac{2y-8}{7y-28}$

Solution:

$$\frac{2y-8}{7y-28} = \frac{2(\cancel{y}-4)}{7(\cancel{y}-4)} = \frac{2}{7}$$

7. $\frac{x+2}{x^2+3x+2}$

Solution:

$$\frac{x+2}{x^2+3x+2} = \frac{\cancel{x}+2}{(x+1)(\cancel{x}+2)} = \frac{1}{x+1}$$

8. $\frac{c^2+2c-8}{3c^2-4c-4}$

Solution:

$$\frac{c^2+2c-8}{3c^2-4c-4} = \frac{(c+4)(\cancel{c}-2)}{(3c+2)(\cancel{c}-2)} = \frac{c+4}{3c+2}$$

9. $\frac{x^2-y^2}{x-y}$

Solution:

$$\frac{x^2-y^2}{x-y} = \frac{(x+y)(\cancel{x}-y)}{\cancel{x}-y} = x+y$$

10. $\frac{40t-25}{20}$

Solution:

$$\frac{40t-25}{20} = \frac{5(8t-5)}{5(4)} = \frac{8t-5}{4}$$

11. $\frac{5a^2b+5a^2c}{15ab+15ac}$

Solution:

$$\frac{5a^2b+5a^2c}{15ab+15ac} = \frac{(5a^2)(\cancel{b}+c)}{(15a)(\cancel{b}+c)} = \frac{5a(a)}{5a(3)} = \frac{a}{3}$$

12. $\frac{2bc+2bd}{6b^2}$

Solution:

$$\frac{2bc+2bd}{6b^2} = \frac{2b(c+d)}{2b(3b)} = \frac{c+d}{3b}$$

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13. $\frac{y-1}{y^2-1}$

Solution:

$$\frac{y-1}{y^2-1} = \frac{y-1}{(y+1)(y-1)} = \frac{1}{y+1}$$

14. $\frac{x^2-9}{x^2+x-6}$

Solution:

$$\frac{x^2-9}{x^2+x-6} = \frac{(x+3)(x-3)}{(x+3)(x-2)} = \frac{x-3}{x-2}$$

15. $\frac{125a^3b-5a^4}{a-25b}$

Solution:

$$\frac{125a^3b-5a^4}{a-25b} = \frac{-5a^3(-25b+a)}{a-25b} = -5a^3$$

16. $\frac{x^2-16}{x^2-8x+16}$

Solution:

$$\frac{x^2-16}{x^2-8x+16} = \frac{(x+4)(x-4)}{(x-4)(x-4)} = \frac{x+4}{x-4}$$

17. $\frac{4-x^2}{x^2-5x+6}$

Solution:

$$\frac{4-x^2}{x^2-5x+6} = \frac{-(-2+x)(2+x)}{(x-2)(x-3)} = \frac{-(2+x)}{x-3}$$

18. $\frac{2x^2-6x}{3x-x^2}$

Solution:

$$\frac{2x^2-6x}{3x-x^2} = \frac{2x(x-3)}{-x(-3+x)} = -\frac{2x}{x} = -2$$

19. $\frac{5r^2-15r+2r-6}{r-3}$

Solution:

$$\begin{aligned} \frac{5r^2-15r+2r-6}{r-3} &= \frac{5r(r-3)+2(r-3)}{r-3} \\ &= \frac{(5r+2)(r-3)}{r-3} = 5r+2 \end{aligned}$$

20. $\frac{x^3-x^2-x+1}{x^2-2x+1}$

Solution:

$$\begin{aligned} \frac{x^3-x^2-x+1}{x^2-2x+1} &= \frac{x^2(x-1)-(x-1)}{(x-1)(x-1)} \\ &= \frac{(x-1)(x^2-1)}{(x-1)(x-1)} = \frac{(x+1)(x-1)}{(x-1)} = x+1 \end{aligned}$$