

Worksheet #22 Section 4.1 — Simplifying Rational Expressions

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Simplify each of the following.

(1) $\frac{6x}{22x}$

(2) $\frac{-24ab^4}{-18a^3c^2}$

(3) $\frac{72xy^2}{-12x^3y^3}$

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

(5) $\frac{15abc^3}{12a^3bc^2}$

(6) $27a^2x^2 - 56ax^3$

(7) $\frac{2x^2 - 4x}{4x}$

(8) $\frac{14a^2b^5}{12a^9b}$

(9) $\frac{24x^3y^5}{18xy^2}$

(10) $\frac{ax - 2a}{4a^2}$

(11) $\frac{4x+2}{2x}$

(12) $\frac{a^2 - 5a - 24}{a^2 - 9}$

(13) $\frac{x-4}{4-x}$

(14) $\frac{x^2-1}{x-1}$

(15) $\frac{2x+4}{3x+6}$

(16) $\frac{3x^2-4}{8x}$

(17) $\frac{t^2-5t-6}{2t^2-4t-6}$

(18) $\frac{ax-a}{a^2-a}$

(19) $\frac{ax-bx}{ax+bx}$

(20) $\frac{4xy^7}{6x^3y^4}$

(21) $\frac{6x-12}{8}$

(22) $\frac{6}{3x-6}$

(23) $\frac{4x^2+2x+4}{4x+8}$

(24) $\frac{2y^2+6y}{xy+3x}$

(25) $\frac{2x-1}{4x-2}$

(26) $\frac{5}{10x-5}$

(27) $\frac{3x^2y-6xy}{12x^2y^2-18xy^3}$

(28) $\frac{2x-5x}{5ax-2ax}$

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

(30) $\frac{x^2+4x-5}{3x+15}$

(31) $\frac{4a+8}{a^2-2a-8}$

(32) $\frac{5x-2}{5x^2+3x-2}$

(33) $\frac{x^2-5x+6}{6-2x}$

(34) $\frac{2y^2+3y-2}{4y^2+2y-2}$

(35) $\frac{a^2-8a+15}{a^2-2a-3}$

(36) $\frac{x^2-2x+1}{3x^2-4x+1}$

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

(38) $\frac{7y^2-28}{y^2-4y+4}$

(39) $\frac{3x^2-7x+2}{3x^2-6x}$

(40) $\frac{t^3+2t^2}{t^2-6t-16}$

(41) $\frac{a^2-b^2}{a-b}$

(42) $\frac{2x^2-16x+14}{6x^2-30x-84}$

(43) $\frac{18x^2+39x+18}{4x^3+12x^2+9x}$

(44) $\frac{z^4-81}{z^2+12z+27}$

(45) $\frac{2x^3-6x^2-20x}{12x^3+18x^2-12x}$

Answers: (1) $\frac{3}{11}$ (2) $\frac{4b^4}{3a^2c^2}$ (3) $\frac{-6}{x^2y}$ (4) $\frac{x+4}{2}$ (5) $\frac{5c}{4a^2}$ (6) $a(-56x+27a)x^2$

(7) $\frac{x^2(x-2)}{2}$ (8) $\frac{7b^4}{6a^7}$ (9) $\frac{4x^2y^3}{3}$ (10) $\frac{x-2}{4a}$ (11) $\frac{2x+1}{x}$ (12) $\frac{a-8}{a-3}$

(13) -1 (14) $x+1$ (15) $\frac{2}{3}$ (16) $\frac{3x^2-4}{8x}$ (17) $\frac{t-6}{2(t-3)}$ (18) $\frac{x-1}{a-1}$

(19) $\frac{a-b}{a+b}$ (20) $\frac{2y^3}{3x^2}$ (21) $\frac{3(x-2)}{4}$ (22) $\frac{2}{x-2}$ (23) $\frac{2x^2+x+2}{2(x+2)}$ (24) $\frac{2y}{x}$

(25) $\frac{1}{2}$ (26) $\frac{1}{2x-1}$ (27) $\frac{x-2}{2(-3y+2x)y}$ (28) $-\frac{1}{a}$ (29) $x+2$ (30) $\frac{x-1}{3}$

(31) $\frac{4}{a-4}$ (32) $\frac{1}{x+1}$ (33) $\frac{-x+2}{2}$ (34) $\frac{y+2}{2(y+1)}$ (35) $\frac{a-5}{a+1}$ (36) $\frac{x-1}{3x-1}$

(37) $\frac{2x-1}{x-1}$ (38) $\frac{7(y+2)}{y-2}$ (39) $\frac{3x-1}{3x}$ (40) $\frac{t^2}{t-8}$ (41) $b+a$ (42) $\frac{x-1}{3(x+2)}$

(43) $\frac{3(3x+2)}{x(2x+3)}$ (44) $\frac{(z-3)(z^2+9)}{z+9}$ (45) $\frac{x-5}{3(2x-1)}$