

Practise, Apply, Solve 4.11, page 369

1. (a) xy (b) ab (c) $x(x-1)$
 (d) $(b+2)(b+1)$ (e) x^2y (f) $(2m+3)(m-3)$
 (g) y^2z^2 (h) $(s-1)(s+1)$ (i) $(x+2)(x-2)$
2. (a) $\frac{2a+7a}{ab}, a, b \neq 0$ (b) $\frac{3x+2}{x^2}, x \neq 0$
 (c) $\frac{4z+5x}{xyz}, x, y, z \neq 0$ (d) $\frac{7y+4x}{x^2y^2}, x, y \neq 0$
 (e) $\frac{3(1+2xy)}{y^2}, y \neq 0$ (f) $\frac{2x^2+5x+5}{x(x+1)}, x \neq 0, -1$
 (g) $\frac{13y+6}{5y(y+2)}, y \neq 0, -2$ (h) $\frac{5x+11}{(x+3)(x+1)}, x \neq -3, -1$
 (i) $\frac{3x^2+x}{x^2+2x-3}, x \neq 1, -3$
3. (a) $\frac{5}{12x}, x \neq 0$ (b) $\frac{3-2y}{y^2}, y \neq 0$ (c) $-\frac{10}{3x}, x \neq 0$
 (d) $\frac{2(5y-3x)}{x^2y^2}, x, y \neq 0$ (e) $\frac{27a-10b}{12a^2b^2}, a \neq 0, b \neq 0$
 (f) $\frac{3(y-3)}{(y+1)(y-1)}, y \neq \pm 1$ (g) $\frac{x^2-19x}{(x+5)(x-3)}, x \neq -5, 3$
 (h) $\frac{-t^2+6t+3}{(t-1)(t+1)}, t \neq \pm 1$ (i) $\frac{-3x-2}{x(x+2)}, x \neq 0, -2$
4. (a) $\frac{-14x+15}{3x^2}, x \neq 0$
 (b) $\frac{-2(2p^2-3p+4)}{p^2q}, p \neq 0, q \neq 0$
 (c) $\frac{x(2y-3yz-9)}{y^2z}, y \neq 0, z \neq 0$
 (d) $\frac{7a+5}{(a+1)(a+3)}, a \neq -1, -3$
 (e) $\frac{-3x-5}{(x+2)^2}, x \neq -2$ (f) $\frac{x^2+3x+20}{2(x+4)^2}, x \neq -4$
 (g) $\frac{2x+9}{6(x-2)}, x \neq 2$ (h) $\frac{17x+1}{5x(x+3)}, x \neq 0, -3$
 (i) $\frac{3(2y-3)}{y(y-2)}, y \neq 0, 2$ (j) $\frac{2}{p+3}, p \neq 0, -3$
 (k) $\frac{5x+4}{(x-2)(x+1)}, x \neq 2, -1$ (l) $\frac{2}{a-3}, a \neq \pm 3$
 (m) $\frac{2}{(y+4)(y-1)}, y \neq -4, 1$
 (n) $\frac{3(m^3+m^2-10m-3)}{(2m-3)(m+3)(m-3)}, m \neq \pm 3, \frac{3}{2}$
5. (a) $\frac{1}{x+1}, x \neq \pm 1$
 (b) $\frac{2x-11}{(x-5)(x-2)(x+5)}, x \neq \pm 5, 2$
 (c) $\frac{a(21a-13)}{(2a+1)(3a-2)(5a-3)}, a \neq -\frac{1}{2}, \frac{2}{3}, \frac{3}{5}$
 (d) $-\frac{1}{3x(3x+h)}, x \neq 0, -\frac{h}{3}, h \neq 0$

- (e) $\frac{7k-5}{(2k-3)(k-2)(k+1)}, k \neq \frac{3}{2}, 2, -1$
 (f) $\frac{a^2+4a+1}{(a-3)(a+3)(a+1)}, a \neq \pm 3, -1$
7. If you find the LCD, then it is easier to put the final answer in lowest terms. Examples may vary.
8. (a) $\frac{6x^2-17xy-14y^2}{24xy}, x, y \neq 0$ (b) $\frac{x^2+3x+20}{2(x+4)^2}, x \neq -4$
9. (a) $\frac{2x+3}{(x-5)(x+1)}, x \neq -1, 2, 5$ (b) $\frac{1}{(x-1)(x+4)}, x \neq -4, 1, 3$
 (c) $\frac{10k^2+21k+5}{(3k-1)(2k+5)(2k+3)}, k \neq \frac{1}{3}, -\frac{5}{2}, -\frac{3}{2}$
 (d) $\frac{9q^2-4q-4}{6(4q+3)(3q-2)(q-2)}, q \neq -\frac{3}{4}, -\frac{2}{3}, 2$
 (e) $\frac{(x+4)(x-2)}{(x-3)(2x-3)}, x \neq \frac{3}{2}, \pm 3, -\frac{1}{2}$
 (f) $\frac{a^2-3a-14}{2(2a+1)(a+5)}, a \neq 0, \frac{5}{3}, -\frac{1}{2}, -5$
10. (a) $x=0$ or $x=-\frac{2}{3}$ (b) $x=\frac{3}{2}$ or $x=-\frac{2}{3}$
11. (a) 1 (b) $-\frac{3}{2}$ (c) $\frac{1}{3}$
 (d) -2 or $\frac{2}{3}$ (e) 8 (f) 3 or $\frac{3}{2}$
12. Arshia's speed: 8.0 km/h; Sarah's speed: 8.4 km/h; Arshia's time: 5.5 h; Sarah's time: 5.25 h
13. 6.67 km/h
14. 3.74 km/h
15. 18 tickets
16. 12 days
17. 33 students
18. (1) Factor the numerators and denominators for both expressions.
 (2) Express the sum or difference of the expressions with a common denominator. (3) Simplify. Explanations of steps may vary.
19. $A=3, B=-7$
20. $A=-\frac{2}{9}, B=\frac{2}{9}, C=\frac{1}{3}$
21. $x=\frac{bc \pm \sqrt{b^2c^2+4abc}}{2b}$