

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

1.
$$\frac{x(x+5)(x-8)}{x^3(x+5)}$$

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

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

2.
$$\frac{x^4(x+5)^2(x-8)}{x^3(x+5)^3}$$

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

3.
$$\frac{9x^2(x+5)^4(x-5)^4}{6x^2(x-5)^3(x+5)^5}$$

3.
$$\frac{10x(x+1)^4(x-1)^2}{15x(x-1)^3(x+1)^3}$$

3.
$$\frac{20x^3(x+3)^3(x-3)^1}{12x^3(x-3)^2(x+3)^2}$$

Simplifying Rational Expressions Part 1

[31.2]

4.
$$\frac{(x^2-9)(x+4)}{(x+3)(x^2-16)}$$

4.
$$\frac{(x^2-25)(x+6)}{(x+5)(x^2-36)}$$

4.
$$\frac{(x^2-49)(x-8)}{(x-7)(x^2-64)}$$

5.
$$\frac{(4x^2-1)(x+3)}{(2x+1)(x^2-9)}$$

5.
$$\frac{(25x^2-16)(x+7)}{(5x+4)(x^2-49)}$$

5.
$$\frac{(9x^2-4)(x-9)}{(3x-2)(x^2-81)}$$

6.
$$\frac{(4x^2-1)(x+3)^2}{(2x+1)(x^2-9)}$$

6.
$$\frac{(25x^2-16)(x+7)^2}{(5x+4)(x^2-49)}$$

6.
$$\frac{(25x^2-4)(x-1)^2}{(5x-2)^2(x^2-1)}$$

1.
$$\frac{x^2+3x+2}{x^2+4x+3}$$

1.
$$\frac{x^2+4x+3}{x^2+5x+4}$$

1.
$$\frac{x^2+5x+4}{x^2+7x+6}$$

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

2.
$$\frac{x^2-3x-10}{x^2-5x-14}$$

2.
$$\frac{x^2+2x-15}{x^2-2x-3}$$

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

3.
$$\frac{x^2-1x-6}{x^2-5x+6}$$

3.
$$\frac{x^2-5x+4}{x^2+3x-4}$$

4.
$$\frac{2x^2+3x+1}{2x^2+5x+3}$$

4.
$$\frac{3x^2+7x+2}{3x^2+4x-4}$$

4.
$$\frac{3x^2-1x-2}{5x^2-2x-3}$$

5.
$$\frac{x^2-5x-14}{x^2-3x-10}$$

5.
$$\frac{x^2-2x-3}{x^2+2x-15}$$

5.
$$\frac{x^2+3x-4}{x^2+2x-3}$$

6.
$$\frac{x^2-3x+2}{x^2-1}$$

6.
$$\frac{x^2-5x+4}{x^2-16}$$

6.
$$\frac{x^2-4x+3}{x^2-9}$$

Adding Rational Expressions

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

2.
$$\frac{3}{x(x-5)^3} + \frac{2}{x^3(x-5)^1}$$

3.
$$\frac{2}{x(x+2)^3} + \frac{1}{x^4(x+2)^5}$$

1.
$$\frac{4}{x^2(x+1)^5} + \frac{1}{x^4(x+1)^3}$$

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

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

[33.1]

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

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

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

Adding Rational Expressions

[33.2]

$$4. \quad \frac{4}{x^4(x+3)^2} + \frac{1}{x^2(x+3)^3}$$

$$4. \quad \frac{4}{x^1(x+1)^4} + \frac{1}{x^3(x+1)^3}$$

$$4. \quad \frac{4}{x^3(x+4)^1} + \frac{1}{x^2(x+4)^2}$$

$$5. \quad \frac{3}{x(x-5)^5} + \frac{2}{x^3(x-5)^6}$$

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

$$5. \quad \frac{2}{x^3(x-4)^1} + \frac{2}{x^2(x-4)^2}$$

$$6. \quad \frac{2}{x(x+2)^4} + \frac{1}{x^4(x+2)^3}$$

$$6. \quad \frac{3}{x(x+3)^5} + \frac{1}{x^5(x+3)^4}$$

$$6. \quad \frac{2}{x^3(x+4)^2} + \frac{2}{x(x+4)^1}$$

Adding Rational Expressions

[33.3]

$$7. \quad \frac{5}{3x^4(x+3)^7} + \frac{3}{2x^2(x+3)^6}$$

$$7. \quad \frac{3}{4x^2(x+1)^6} + \frac{1}{3x^4(x+1)^5}$$

$$7. \quad \frac{7}{5x^3(x+4)^2} + \frac{3}{4x^2(x+4)^1}$$

$$8. \quad \frac{4}{5x^2(x-7)^3} + \frac{1}{6x^3(x-7)^2}$$

$$8. \quad \frac{3}{4x^5(x-5)^4} + \frac{1}{3x^3(x-5)^3}$$

$$8. \quad \frac{1}{2x^1(x-4)^2} + \frac{2}{3x^3(x-4)^1}$$

$$9. \quad \frac{4}{3x^5(x-2)^2} + \frac{2}{6x^3(x-2)^1}$$

$$9. \quad \frac{5}{2x^6(x-1)^4} + \frac{3}{4x^3(x-1)^3}$$

$$9. \quad \frac{3}{2x^1(x-5)^5} + \frac{5}{6x^3(x-5)^4}$$

Adding Rational Expressions

[33.4]

$$10. \frac{5}{6x^4(x-1)^6} + \frac{3}{4x^3(x-1)^5}$$

$$10. \frac{4}{8x^4(x-5)^4} + \frac{2}{6x^5(x-5)^3}$$

$$10. \frac{7}{9x^3(x-7)^2} + \frac{2}{6x^2(x-7)^1}$$

$$11. \frac{3}{6x^4(x-4)^1} + \frac{4}{3x^6(x-4)^2}$$

$$11. \frac{4}{4x^5(x-6)^3} + \frac{3}{2x^3(x-6)^4}$$

$$11. \frac{3}{4x^1(x-8)^5} + \frac{2}{8x^3(x-8)^6}$$

$$12. \frac{4}{12x^3(x+1)^1} + \frac{2}{8x^3(x+1)^2}$$

$$12. \frac{5}{12x^4(x+1)^3} + \frac{3}{9x^4(x+1)^4}$$

$$12. \frac{3}{15x^1(x+7)^4} + \frac{2}{6x^1(x+7)^5}$$

Solving rational equations

[34.1]

Solve for x

1. $\frac{2}{3x} + \frac{1}{2x} = \frac{1}{4}$

1. $\frac{1}{2x} + \frac{3}{5x} = \frac{1}{4}$

1. $\frac{3}{4x} + \frac{2}{5x} = \frac{1}{2}$

2. $\frac{2}{3} + \frac{1}{2} = \frac{1}{4x}$

2. $\frac{1}{2} + \frac{3}{5} = \frac{1}{4x}$

2. $\frac{3}{4} + \frac{2}{5} = \frac{1}{2x}$

Solve for x

3.
$$\frac{2}{9} + \frac{1}{6x} = \frac{2}{3} - \frac{5}{2x}$$

3.
$$\frac{1}{2} + \frac{2}{3x} = \frac{1}{12} - \frac{5}{4x}$$

3.
$$\frac{4}{9x} - \frac{5}{6x} = \frac{2}{3x} + \frac{1}{6}$$

4.
$$\frac{4}{3x} - \frac{1}{6x} = \frac{5}{2} - \frac{1}{3}$$

4.
$$\frac{5}{2x} - \frac{2}{4x} = \frac{11}{8} - \frac{1}{2}$$

4.
$$\frac{4}{9} - \frac{5}{6} = \frac{2}{3x} - \frac{1}{6x}$$

Solving rational equations

[34.3]

Solve for x

5. $\frac{3}{8} + \frac{1}{4x} = \frac{3}{2} - \frac{5}{x}$

5. $\frac{7}{10} + \frac{2}{5x} = \frac{1}{2} - \frac{5}{x}$

5. $\frac{5}{9} + \frac{1}{6x} = \frac{2}{3} - \frac{5}{x}$

6. $\frac{5}{3x} - \frac{1}{6x} = \frac{3}{2} - \frac{1}{3}$

6. $\frac{3}{2x} - \frac{1}{4x} = \frac{5}{8} - \frac{1}{2}$

6. $\frac{4}{9x} - \frac{5}{6x} = \frac{2}{3} - \frac{1}{6}$

Solve for the given term

1. $A = 4\pi r^2, r$

1. $A = 36\pi r^2, r$

1. $A = 9\pi r^2, r$

2. $A = \frac{a+b+c}{3}, c$

2. $A = \frac{a+b}{2}, b$

2. $A = \frac{a+b+c+d}{4}, a$

3. $A = k(b - c + d), b$

3. $A = k(b - c), b$

3. $A = k(b - c + d - e), b$

Solve for the given term

4. $A = 5(2b + 3c), b$

4. $B = 7(3b + 4c), b$

4. $C = 9(4b + 5c), b$

5. $A = \frac{h(b_1 - b_2 + b_3)}{3}, b_1$

5. $A = \frac{h(b_1 + b_2 - b_3)}{3}, b_1$

5. $A = \frac{h(b_1 + b_2)}{2}, b_1$

Solve for the given term

$$6. \quad a^2 - b^2 + c^2 = d^2, a \quad 6. \quad a^2 - b^2 - c^2 = d^2, a \quad 6. \quad a^2 + b^2 = c^2, a$$

$$7. \quad a^3 - b^3 - c^3 = d, a \quad 7. \quad a^3 - b^3 + c^3 = d, a \quad 7. \quad a^3 + b^3 + c^3 = d, a$$

$$8. \quad \sqrt[3]{a^2 + b^2 + c^2} = d, c \quad 8. \quad \sqrt[4]{a^2 - b^2 + c^2} = d, c \quad 8. \quad \sqrt{c^2 - b^2} = a, c$$