

A2.A.17: Complex Fractions 3: Simplify complex fractional expressions

1 Express in simplest form: $\frac{\frac{2}{x}}{\frac{1}{2x}}$

7 Express in simplest form: $\frac{\frac{x-y}{y}}{\frac{1}{y} - \frac{1}{x}}$

2 Express as a fraction in *simplest form*: $\frac{\frac{1}{ab}}{\frac{1}{a} - \frac{1}{b}}$

8 Simplify completely: $\frac{\frac{1-m}{m}}{m - \frac{1}{m}}$

3 Express in simplest form: $\frac{\frac{1}{a}}{\frac{1}{a} - \frac{1}{b}}$

9 Express in simplest form: $\frac{x - \frac{4}{x}}{\frac{2+x}{x}}$

4 Express $\frac{\frac{a}{b}}{\frac{1}{a} - \frac{1}{b}}$ in simplest form.

10 Simplify: $\frac{\frac{x}{3} - \frac{3}{x}}{\frac{x-3}{x}}$

5 Express in simplest form: $\frac{\frac{1}{2} + \frac{1}{x}}{\frac{1}{x}}$

11 Express in *simplest form*: $\frac{n - \frac{1}{n}}{\frac{1-n^2}{n}}$

6 Write in simplest form: $\frac{\frac{1}{x}}{1 + \frac{1}{x}}$

12 Express in simplest form: $\frac{\frac{1}{2} - \frac{4}{d}}{\frac{1}{d} + \frac{3}{2d}}$

13 Simplify: $\frac{\frac{1}{4} + \frac{1}{4x}}{\frac{1}{x} + \frac{1}{4}}$

19 Express in simplest form: $\frac{\frac{1}{r} - \frac{1}{s}}{\frac{r^2}{s^2} - 1}$

14 Simplify: $\frac{\frac{1}{3} + \frac{1}{3x}}{\frac{1}{x} + \frac{1}{3}}$

20 Express $\frac{\frac{3}{x^2} + \frac{1}{x}}{1 - \frac{9}{x^2}}$ in simplest form.

15 Express in simplest form: $\frac{\frac{3}{4} + \frac{3}{x}}{\frac{1}{x} + \frac{1}{4}}$

21 Express in simplest form: $\frac{1 + \frac{2}{x}}{x - \frac{4}{x}}$

16 Express in simplest form: $\frac{1 + \frac{x}{y}}{\frac{1}{x} + \frac{1}{y}}$

22 Express in simplest form: $\frac{x - \frac{9}{x}}{2 + \frac{6}{x}}$

17 Express in simplest form: $\frac{\frac{x}{4} - \frac{4}{x}}{1 - \frac{4}{x}}$

23 Express in simplest form: $\frac{x - \frac{1}{x}}{1 + \frac{1}{x}}$

18 Express in simplest form: $\frac{1 - \frac{1}{x}}{\frac{1}{x^2} - \frac{1}{x}}$

24 Express in simplest form: $\frac{x - \frac{1}{x}}{1 - \frac{1}{x}}$

25 Express $\frac{\frac{x}{3} - 1}{\frac{x^2}{3} - 3}$ in simplest form.

31 Simplify: $\frac{\frac{x}{x-3} + \frac{4}{x}}{1 - \frac{1}{3-x}}$

26 Simplify for all values of a for which the expression is defined: $\frac{1 - \frac{2}{a}}{\frac{4}{a^2} - 1}$

32 Express in simplest form: $\frac{1 - \frac{1}{x}}{x - 2 + \frac{1}{x}}$

27 Express in simplest form: $\frac{\frac{1}{4x^2} - 1}{2 - \frac{1}{x}}$

33 Express in simplest terms: $\frac{1 + \frac{3}{x}}{1 - \frac{5}{x} - \frac{24}{x^2}}$

28 Express in simplest form: $\frac{\frac{5}{a+b} - \frac{5}{a-b}}{\frac{10}{a^2 - b^2}}$

34 Simplify: $\frac{\frac{3a+b}{2a-b} - \frac{3a-b}{2a+b}}{\frac{2a}{4a^2 - b^2}}$

29 Perform the indicated operations and express in simplest form: $\frac{\frac{1}{x+h} - \frac{1}{x}}{h}$

35 Simplify: $\frac{1 - \frac{3}{\cos x}}{\frac{9}{\cos^2 x} - 1}$

30 Express in simplest form: $\frac{2 + \frac{4}{x-2}}{\frac{2}{x-2}}$

36 Express in simplest form: $\frac{\frac{4-x^2}{x^2+7x+12}}{\frac{2x-4}{x+3}}$

37 Express in simplest form: $\frac{\frac{36-x^2}{(x+6)^2}}{\frac{x-3}{x^2+3x-18}}$

A2.A.17: Complex Fractions 3: Simplify complex fractional expressions**Answer Section**

1 ANS:
4

REF: 069505siii

2 ANS:
 $\frac{1}{b-a}$

REF: 068608siii

3 ANS:
 $\frac{b}{b-a}$

REF: 010209siii

4 ANS:
 $\frac{a^2}{b-a}$

REF: 080312siii

5 ANS:
 $\frac{x+2}{2}$

REF: 068004siii

6 ANS:
 $\frac{1}{x+1}$

REF: 068508siii

7 ANS:
 x

REF: 060012siii

8 ANS:
 $\frac{-1}{m+1}$

REF: 010629b

9 ANS:
 $x-2$

REF: 010826b

10 ANS:

$$\frac{x+3}{3}$$

REF: 060823b

11 ANS:

$$-1$$

REF: 068105siii

12 ANS:

$$\frac{\frac{1}{2} - \frac{4}{d}}{\frac{1}{d} + \frac{3}{2d}} = \frac{\frac{d-8}{2d}}{\frac{2d+3d}{2d^2}} = \frac{d-8}{2d} \times \frac{2d^2}{5d} = \frac{d-8}{5}$$

REF: 061035a2

13 ANS:

$$\frac{x+1}{x+4} \cdot \frac{\frac{1}{4} + \frac{1}{4x}}{\frac{1}{x} + \frac{1}{4}} = \frac{\frac{4x+4}{16x}}{\frac{4+x}{4x}} = \frac{4(x+1)}{16x} \cdot \frac{4x}{x+4} = \frac{x+1}{x+4}$$

REF: 061021b

14 ANS:

$$\frac{x+1}{3+x}$$

REF: 069010siii

15 ANS:

$$3$$

REF: 019910siii

16 ANS:

$$x$$

REF: 089310siii

17 ANS:

$$\frac{x+4}{4}$$

REF: 080323b

18 ANS:

$$-x$$

REF: 019740siii

19 ANS:

$$-\frac{s}{r(r+s)}$$

REF: 080425b

20 ANS:

$$\frac{1}{x-3}$$

REF: 080014siii

21 ANS:

$$\frac{1}{x-2}$$

REF: 019016siii

22 ANS:

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

REF: 060210siii

23 ANS:

$$x-1$$

REF: 080213siii

24 ANS:

$$x+1$$

REF: 018404siii

25 ANS:

$$\frac{1}{x+3}$$

REF: 010012siii

26 ANS:

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

REF: 060628b

27 ANS:

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

REF: 068838siii

28 ANS:

$$-b$$

REF: 080930b

29 ANS:

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

REF: 088437siii

30 ANS:

$$x$$

REF: 018717siii

31 ANS:

$$\frac{x+6}{x}$$

REF: 089838siii

32 ANS:

$$\frac{1}{x-1}$$

REF: 080824b

33 ANS:

$$\frac{1 + \frac{3}{x}}{1 - \frac{5}{x} - \frac{24}{x^2}} \cdot \frac{x^2}{x^2} = \frac{x^2 + 3x}{x^2 - 5x - 24} = \frac{x(x+3)}{(x-8)(x+3)} = \frac{x}{x-8}$$

REF: 061436a2

34 ANS:

$$5b$$

REF: 099801al

35 ANS:

$$\frac{-\cos x}{3 + \cos x}$$

REF: 019539siii

36 ANS:

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

REF: 061236a2

37 ANS:

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

REF: 011529a2