

**A2.A.17: Complex Fractions 2: Simplify complex fractional expressions**

1 The expression  $\frac{\frac{a-1}{a}}{\frac{a^2-1}{a^2}}$  is equivalent to

7 The expression  $\frac{\frac{a}{b} - \frac{b}{a}}{\frac{1}{a} + \frac{1}{b}}$  is equivalent to

2 The expression  $\frac{\frac{3x}{x+3}}{\frac{x}{x^2-9}}$  is equivalent to

8 In simplest form,  $\frac{\frac{1}{x^2} - \frac{1}{y^2}}{\frac{1}{y} + \frac{1}{x}}$  is equal to

3 In a science experiment, when resistor  $A$  and resistor  $B$  are connected in a parallel circuit, the total resistance is  $\frac{1}{\frac{1}{A} + \frac{1}{B}}$ . This complex fraction is equivalent to

9 The expression  $\frac{\frac{1}{x} + \frac{1}{y}}{\frac{1}{x^2} - \frac{1}{y^2}}$  is equivalent to

4 The expression  $\frac{\frac{1}{x} + \frac{3}{y}}{\frac{2}{xy}}$  is equivalent to

10 The expression  $\frac{\frac{1}{3} - \frac{1}{x}}{\frac{3}{x} - 1}$  is equivalent to

5 The expression  $\frac{\frac{1}{3} + \frac{1}{3x}}{\frac{1}{x} + \frac{1}{3}}$  is equivalent to

11 The expression  $\frac{\frac{a}{b} - 1}{\frac{a}{b} + 1}$  is equivalent to

6 Written in simplest form, the expression  $\frac{\frac{x}{4} - \frac{1}{x}}{\frac{1}{2x} + \frac{1}{4}}$  is equivalent to

12 The fraction  $\frac{\frac{x}{y} + x}{\frac{1}{y} + 1}$  is equivalent to

- 13 When simplified, the complex fraction

$$\frac{1 + \frac{1}{x}}{\frac{1}{x} - x}, x \neq 0, \text{ is equivalent to}$$

- 14 Which expression is equivalent to the complex

$$\text{fraction } \frac{\frac{1}{a} - a}{\frac{1}{a} + 1}?$$

- 15 In simplest form, the expression  $\frac{\frac{1}{x} - 1}{x - \frac{1}{x}}$  is  
equivalent to

- 16 The complex fraction  $\frac{x - \frac{1}{3}}{3 - \frac{1}{x}}$  is equivalent to

- 17 The expression  $\frac{\frac{4}{x} - 2}{6 - \frac{12}{x}}$  is equal to

- 18 The fraction  $\frac{b + \frac{b}{a}}{a - \frac{1}{a}}$  is equivalent to

- 19 The expression  $\frac{a + \frac{b}{c}}{d - \frac{b}{c}}$  is equivalent to

- 20 The complex fraction  $\frac{x - y}{\frac{1}{y} - \frac{1}{x}}$  is equivalent to

- 21 The fraction  $\frac{1 + \frac{1}{x}}{1 - \frac{1}{x^2}}$  is equivalent to

- 22 The expression  $\frac{\frac{x^2}{y} - y}{\frac{x}{y} + 1}$  is equivalent to

- 23 Which expression is equivalent to the complex

$$\text{fraction } \frac{\frac{x}{x+2}}{1 - \frac{x}{x+2}}?$$

- 24 The expression  $\frac{1 - \frac{x}{x-y}}{\frac{1}{x-y}}$

- 25 The expression  $\frac{\frac{2x}{x+1}}{1 - \frac{x}{x+1}}$  is equivalent to

- 26 The simplest form of  $\frac{1 - \frac{4}{x}}{1 - \frac{2}{x} - \frac{8}{x^2}}$  is

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### Answer Section

1 ANS:

$$\frac{a}{a+1}$$

REF: 069618siii

2 ANS:

$$3x - 9$$

REF: 010320siii

3 ANS:

$$\frac{AB}{A+B}$$

REF: 060112b

4 ANS:

$$\frac{3x+y}{2}$$

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

$$\frac{\frac{xy}{2}}{xy} = \frac{3x+y}{xy} \cdot \frac{xy}{2} = \frac{3x+y}{2}$$

REF: 011603a2

5 ANS:

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

REF: 010706b

6 ANS:

$$x - 2$$

REF: fall0920a2

7 ANS:

$$a - b$$

REF: 010206b

8 ANS:

$$\frac{y-x}{xy}$$

REF: 060317b

9 ANS:

$$\frac{xy}{y-x}$$

REF: 060415b

10 ANS:

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

REF: 060713b

11 ANS:

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

REF: 069818siii

12 ANS:

$$x$$

REF: 010312b

13 ANS:

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

REF: 080513b

14 ANS:

$$1-a$$

REF: 080706b

15 ANS:

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

REF: 089531siii

16 ANS:

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

REF: 068934siii

17 ANS:

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

REF: 089027siii

18 ANS:

$$\frac{b}{a-1}$$

REF: 060128siii

19 ANS:

$$\frac{ac+b}{cd-b}$$

$$\frac{a+\frac{b}{c}}{d-\frac{b}{c}} = \frac{\frac{ac+b}{c}}{\frac{cd-b}{c}} = \frac{ac+b}{c} \cdot \frac{c}{cd-b} = \frac{ac+b}{cd-b}$$

REF: 011405a2

20 ANS:

$$xy$$

REF: 088735siii

21 ANS:

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

REF: 018924siii

22 ANS:

$$x-y$$

REF: 080119siii

23 ANS:

$$\frac{x}{2}$$

REF: 080220b

24 ANS:

$$-y$$

REF: 060919b

25 ANS:

$$2x$$

REF: 010126siii

26 ANS:

$$\frac{x}{x+2}$$

$$\frac{1-\frac{4}{x}}{1-\frac{2}{x}-\frac{8}{x^2}} \times \frac{x^2}{x^2} = \frac{x^2-4x}{x^2-2x-8} = \frac{x(x-4)}{(x-4)(x+2)} = \frac{x}{x+2}$$

REF: 061305a2