

1. Which ones of these are algebraic fraction, take circles on them

$$\frac{1}{3}, \frac{1}{x}, \frac{x^2-1}{2}, \frac{3xy}{\pi}, \frac{2}{x+y}, a + \frac{1}{m}$$

2. Fill in the blanks

(1) when $x =$ _____, the fraction $\frac{1}{x-5}$ has meaning; when $x =$ _____, the fraction $\frac{x^2-1}{x+1} = 0$

(2) $\frac{a^2}{a+3} - \frac{9}{a+3} =$ _____.

(3) $\frac{1}{x} + \frac{1}{2x} + \frac{1}{3x} =$ _____.

(4) if $\frac{x+2y}{y} = 4$, then $\frac{x^2+xy}{y^2} =$ _____.

(5) $\frac{3a}{5xy} = \frac{(\quad)}{10axy}$, $\frac{a+2}{a^2-4} = \frac{1}{(\quad)}$

3. Simplify the fractions

(1) $\frac{x^6}{x^2}$

(2) $\frac{2xy^2}{4x^2y}$

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

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

(5) $\frac{12xy}{5a} \div 8x^2y$

(6) $\frac{x^2-9}{x^2-6x+9}$

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

4. Calculate and simplify your answers.

(1) $\frac{a-c}{a} - \frac{b-c}{a}$

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

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

(4) $\frac{3}{a} + \frac{a-10}{5a}$

(5) $\frac{3b}{5x} - \frac{b}{x}$

$$(6) \frac{a-b}{ab} - \frac{a+b}{ab^2}$$

$$(7) \frac{2a}{a^2-4} - \frac{1}{a+2}$$

$$(8) \frac{a}{a-b} - \frac{ab}{a^2-b^2} + \frac{b}{a+b}$$

$$(9) \frac{ab^2}{4c} \times \left(-\frac{2c}{3a^2b}\right)$$

$$(10) 3xy^2 \div \frac{6y^2}{x}$$

$$(11) \frac{x^2-1}{y^2} \times \frac{y}{x+1}$$

$$(12) \frac{x^2-y^2}{xy} \div \frac{x+y}{x}$$

$$(13) \frac{ab-a^2}{ab} \div \frac{a^2-2ab+b^2}{b}$$

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

5. Solve the fraction equations

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

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

$$(3) \frac{x}{x-5} = \frac{x-2}{x+6}$$

$$(4) \frac{7-9x}{2-3x} - \frac{4x-5}{2-3x} = 1$$

6. The distance between A and B are 80 km. A bus drive from A to B, after 3 hours, a car also drive from A to B, the velocity of car is 3 times the velocity of bus. If the car arrives at B 20 minutes later than bus. Find the velocity for the car and bus.

7. Two groups of student went to the same hospital to do community service. The distance between school and hospital is 4.5km. Group A student walked there, after 30 minutes, group B students departed by taking bicycle. The speed of waling is one third of the speed of taking bicycle. If they arrived at hospital at the same time. Calculate the speed for waling and taking bicycles.