

Topic: Fractions

10.01

$$3\frac{1}{5} - \frac{2}{3}$$

$$\frac{16}{5} - \frac{2}{3}$$

$$= \frac{(3 \times 16) - (5 \times 2)}{5 \times 3}$$

$$= \frac{48 - 10}{15}$$

$$= \frac{38}{15}$$

10.02

$$1\frac{3}{5} + 2\frac{4}{7}$$

$$\frac{8}{5} + \frac{18}{7}$$

$$= \frac{(7 \times 8) + (5 \times 18)}{5 \times 7}$$

$$= \frac{56 + 90}{35}$$

$$= \frac{146}{35}$$

10.03

$$3\frac{5}{8} + 4\frac{2}{3}$$

$$\frac{29}{8} + \frac{14}{3}$$

$$= \frac{(3 \times 29) + (8 \times 14)}{8 \times 3}$$

$$= \frac{87 + 112}{24}$$

$$= \frac{199}{24}$$

10.04

$$4\frac{1}{3} - 1\frac{1}{2}$$

$$\frac{13}{3} - \frac{3}{2}$$

$$= \frac{(2 \times 13) - (3 \times 3)}{3 \times 2}$$

$$= \frac{26 - 9}{6}$$

$$= \frac{17}{6}$$

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10.05

$$1\frac{1}{8} \div \frac{3}{4}$$

$$\frac{9}{8} \div \frac{3}{4} \text{ flip}$$

$$\frac{9}{8} \times \frac{4}{3}$$

$$= \frac{36}{24} \div 12$$

$$= \frac{3}{2}$$

10.06

$$\frac{2}{5} \div 1\frac{1}{10}$$

$$\frac{2}{5} \div \frac{11}{10} \text{ flip}$$

$$\frac{2}{5} \times \frac{10}{11}$$

$$= \frac{20}{55} \div 5$$

$$= \frac{4}{11}$$

10.07

$$6\frac{1}{5} - 2\frac{1}{3}$$

$$\frac{31}{5} - \frac{7}{3}$$

$$= \frac{(3 \times 31) - (5 \times 7)}{5 \times 3}$$

$$= \frac{93 - 35}{15}$$

$$= \frac{58}{15}$$

10.08

$$\frac{5}{12} \times 2\frac{2}{9}$$

$$\frac{5}{12} \times \frac{20}{9}$$

$$= \frac{100}{108} \div 4$$

$$= \frac{25}{27}$$

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10.09

$$\frac{7}{x+5} - \frac{3}{x}$$

$$= \frac{7x - 3(x+5)}{x(x+5)}$$

$$= \frac{7x - 3x - 15}{x(x+5)}$$

$$= \frac{4x - 15}{x(x+5)}$$

10.10

$$\frac{1}{2x} - \frac{1}{3x}$$

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

$$= \frac{x}{6x^2}$$

$$= \frac{1}{6x}$$

10.11

$$\frac{1}{p} + \frac{2}{p+5}$$

$$= \frac{p+5 + 2p}{p(p+5)}$$

$$= \frac{3p+5}{p(p+5)}$$

10.12

$$\frac{3}{m} + \frac{4}{m+1}$$

$$= \frac{3(m+1) + 4m}{m(m+1)}$$

$$= \frac{3m+3+4m}{m(m+1)}$$

$$= \frac{7m+3}{m(m+1)}$$

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10.13

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

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

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

10.14

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

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

$$= \frac{5}{2x + 3}$$

10.15

$$\frac{p^2 - 4q^2}{3p + 6q}$$

$$= \frac{(p + 2q)(p - 2q)}{3(p + 2q)}$$

$$= \frac{p - 2q}{3}$$

10.16

$$\frac{2x^2 - 6x}{x^2 - 9}$$

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

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

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10.17

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

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

$$= \frac{3x^2 + 2x - x^2}{x^3}$$

$$= \frac{2x^2 + 2x}{x^3}$$

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

10.18

$$\frac{5}{x} - \frac{3}{x-2}$$

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

$$= \frac{5x - 10 - 3x}{x(x-2)}$$

$$= \frac{2x - 10}{x(x-2)}$$

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

10.19

$$\frac{a}{x} - \frac{b}{y}$$

$$= \frac{ay - bx}{xy}$$

10.20

$$\frac{5p^2}{8} + \frac{p}{2}$$

$$= \frac{10p^2 + 8p}{16}$$

$$= \frac{2p(5p+4)}{16}$$

$$= \frac{p(5p+4)}{8}$$

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10.21

$$\frac{2}{a} \times \frac{3}{a+4}$$

$$= \frac{2(a+4) - 3a}{a(a+4)}$$

$$= \frac{2a + 8 - 3a}{a(a+4)}$$

$$= \frac{-a + 8}{a(a+4)}$$

10.22

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

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

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

$$= \frac{6x}{(x-1)(x+2)}$$

10.23

$$\frac{s^2}{t} \times \frac{3t}{2s}$$

$$= \frac{3s^2t}{2st}$$

$$= \frac{3s}{2}$$

10.24

$$\frac{a}{b} \times \frac{3b}{a^2}$$

$$= \frac{3ab}{a^2b}$$

$$= \frac{3}{a}$$

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10.25

$$\frac{3y^2 - 6y}{y^2 + y - 6}$$

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

$$= \frac{3y}{y+3}$$

10.26

$$\frac{4}{x+3} + \frac{3}{x}$$

$$= \frac{4x + 3(x+3)}{x(x+3)}$$

$$= \frac{4x + 3x + 9}{x(x+3)}$$

$$= \frac{7x + 9}{x(x+3)}$$

10.27

$$\frac{17+x}{24+x} = \frac{2}{3}$$

$$3(17+x) = 2(24+x)$$

$$51 + 3x = 48 + 2x$$

(-51) (-2x)    (-51) (-2x)

$$x = -3$$

This could also be a solving equations question.

10.28

$$\frac{m}{3} = \frac{(1-m)}{5}$$

$$5m = 3(1-m)$$

$$5m = 3 - 3m$$

(+3m)            (+3m)

$$8m = 3$$

$$m = \frac{3}{8}$$

This could also be a solving equations question.

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10.29

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

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

$$= \frac{2}{x+1}$$

10.30

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

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

$$= \frac{3x - 6 - x - 1}{(x+1)(x-2)}$$

$$= \frac{2x - 7}{(x+1)(x-2)}$$

10.31

$$\frac{3x-15}{(x-5)^2}$$

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

$$= \frac{3}{x-5}$$

10.32

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

$$= \frac{(2x+5)(2x+5)}{(2x-1)(2x+5)}$$

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



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10.33

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

$$= \frac{3x - 2(x+1)}{6} = 4$$

$$\Rightarrow 3x - 2x - 2 = 24$$

$$x - 2 = 24$$

$$x = 26$$

This could also be a solving equations question.

10.34

$$\frac{3}{x} - \frac{4}{x+1}$$

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

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

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

10.35

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

$$= \frac{a^2 + b^2}{ab}$$

10.36

$$\frac{1}{x^2} + \frac{1}{x}$$

$$= \frac{x + x^2}{x^3}$$

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

$$= \frac{1+x}{x^2}$$

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10.37

$$\frac{1}{2x} - \frac{1}{3x}$$

X

$$= \frac{3x - 2x}{6x^2}$$

$$= \frac{x}{6x^2}$$

$$= \frac{1}{6x}$$

10.38

$$\frac{x^2 - 4x}{x^2 + x - 20}$$

$$= \frac{x(x-4)}{(x+5)(x-4)}$$

$$= \frac{x}{x+5}$$

10.39

$$\frac{5t}{5} \div \frac{t}{25^2}$$

flip

$$\frac{5t}{5} \times \frac{25^2}{t}$$

$$= \frac{105^2 t}{5t}$$

$$= 105$$