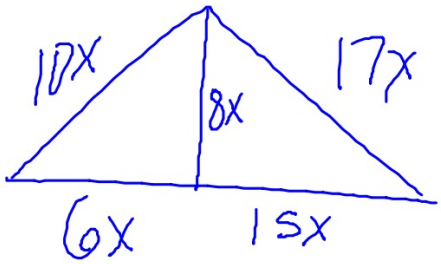
47.



Perimeter: $10x + 17x + 15x + 6x = 48x$

Area: $\frac{1}{2}(21x)(8x) = 84x^2$

$$\frac{P}{A} = \frac{48x}{84x^2} = \frac{4}{7x}$$

35.) $\frac{8x^2y^2z}{xz^3} \cdot \frac{x^4z}{10xy}$

$\frac{8x^6y^2z^2}{10x^2yz^3}$

$\frac{4x^4y}{5z}$

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

26.) C

24.) $\dfrac{x^2-5}{(x+7)(x-2)} - \dfrac{x+3(x-2)}{x+7(x-2)}$

LCD: $(x+7)(x-2)$

$$\frac{x^2-5-(x^2+x-6)}{(x+7)(x-2)}$$

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

15) $\underbrace{3x(x-3)}$, $6x^2$

$2 \cdot 3x^2$

$2 \cdot 3x(x-3) \cdot x$

$6x^2(x-3)$

27.) $\dfrac{(x+3)\,x}{(x+3)(x+3)(x-3)} + \dfrac{(x+1)(x-3)}{(x+3)(x+3)}$

LCD:
$(x-3)(x+3)(x+3)$

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

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

5.5 cont. - Complex Fractions

A complex fraction is a fraction that contains a fraction in its numerator and or denominator.

ex: Simplify.

a) $\dfrac{\frac{2}{3}}{\frac{3}{7}}$ $\quad \frac{2}{3} \div \frac{3}{7} = \frac{2}{3} \cdot \frac{7}{3} = \frac{14}{9}$

ex: Simplify.

b) $\dfrac{\frac{2}{3}-\frac{1}{5}}{\frac{5}{12}} = \left(\frac{2}{3}-\frac{1}{5}\right) \div \frac{5}{12}$

$\frac{7}{5\cancel{15}} \cdot \frac{\cancel{12}^{4}}{5} = \frac{28}{25}$

2 Methods For Simplifying Complex Fractions:

1. "stay-change-flip" - best for complex fractions containing ONE fraction in both the numerator and denominator.

$$\text{ex: } \frac{\frac{2}{3}}{\frac{3}{7}}$$

2. "LCM" - best for complex fractions containing MORE THAN ONE fraction in either the numerator and denominator.

$$\text{ex: } \frac{\frac{2}{3}-\frac{1}{5}}{\frac{5}{12}}$$

$$\frac{60\left(\frac{2}{3}-\frac{1}{5}\right)}{\frac{5}{12}(60)}$$

$$\frac{40-12}{25}$$

$$\frac{28}{25}$$

LCM of all the denominators

3, 5, 12

$\boxed{60}$

ex: Simplify.

c) $\dfrac{\frac{x}{x}\cdot\frac{1}{1}+\frac{1}{x}}{\frac{x}{x}\cdot\frac{3}{1}-\frac{1}{x}} = \dfrac{\frac{x+1}{x}}{\frac{3x-1}{x}} \quad \dfrac{x+1}{x}\cdot\dfrac{x}{3x-1} = \dfrac{x+1}{3x-1}$

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

ex: Simplify.

LCM: x

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

ex: Simplify.

LCM: $3xy$

$3xy$ d) $\dfrac{\dfrac{1}{x}+\dfrac{1}{y}}{2-\dfrac{1}{3}}$ $3xy$ $\quad \dfrac{5}{3}\cdot 3xy$

$$= \frac{3y+3x}{5xy}$$

ex: Simplify.

e) $$\frac{\left(\frac{3(x+2)}{x-2}+\frac{4(x-2)}{x+2}\right)(x+2)(x-2)}{\left(\frac{7}{x^2-4}\right)} = \left(\frac{3x+6+4x-8}{(x-2)(x+2)}\right) \div \left(\frac{7}{x^2-4}\right)$$

$$\frac{7x-2}{\cancel{(x-2)(x+2)}} \cdot \frac{\cancel{x^2-4}}{7} = \frac{7x-2}{7}$$

ex: Simplify.

Method #1

f) $$\frac{1+\dfrac{1}{x-1}}{1+\dfrac{1}{x+1}}$$

$$\left(1+\frac{1}{x-1}\right) \div \left(1+\frac{1}{x+1}\right)$$

$$\left(\frac{x-1+1}{x-1}\right) \div \left(\frac{x+1+1}{x+1}\right)$$

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

ex: Simplify.

LCM: x^2

g) $\dfrac{x+x^{-2}}{1+7x^{-1}} = \dfrac{x^2 \cdot x + \frac{1}{x^2} \cdot x^2}{x^2 \cdot 1 + \frac{7}{x} \cdot x^2} = \dfrac{x^3+1}{x^2+7x} = \dfrac{x^3+1}{x(x+7)}$