

1. Which is simplified correctly? Explain or show your work clearly.

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

No, Can't cancel addition with division.
You MUST factor before simplifying.

$\frac{x^2 + 5x + 6}{x + 3} = x + 2$

x^2	$3x$
x	$3x$
$2x$	6

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

Division cancels multiplication

Simplify the expressions below. Make sure to list any domain restrictions.

2. $\frac{(x+2)^2}{6x^2} \cdot \frac{3x}{x^2-4} = \frac{(x+2)(x+2)}{2 \cancel{3} \cancel{3} x^2} \cdot \frac{\cancel{3} x}{(x+2)(x-2)} = \frac{x+2}{2x(x-2)}$

x^2	$2x$
x	$2x$
-2	-4

D: $x \neq 0, 2, -2$

3. $\frac{2x^2+12x}{4x+8} \cdot \frac{x^2-4x-12}{x^2-36} = \frac{2x(x+6)}{2 \cdot 4(x+2)} \cdot \frac{(x+2)(x+6)}{(x+6)(x+6)} = \frac{x}{2}$

x^2	$6x$
x	$6x$
$+2$	-12

x^2	$6x$
x	$6x$
-6	-36

D: $x \neq -2, -6, 6$

4. $\frac{x^2-4}{x^2-x-6} \cdot \frac{3x^2+15x}{6x^2-12x} = \frac{(x+2)(x-2)}{(x+2)(x-3)} \cdot \frac{\cancel{3}(x+5)}{\cancel{6}(x-2)} = \frac{(x+5)}{2(x-3)}$

x^2	$2x$
x	$2x$
-2	-4

D: $x \neq -2, 3, 0, 2$

x^2	$-3x$
x	$-3x$
$+2$	-6

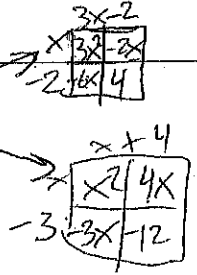
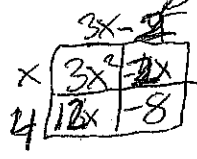
5. $\frac{(x-5)}{1} \cdot \frac{7}{x^3-5x^2} = \frac{7(x+5)}{x^2(x+5)} = \frac{7}{x^2}$

D: $x \neq 0, 5$

$$6. \frac{5x-15}{3x^2+10x-8} \div \frac{x^2+x-12}{3x^2-8x+4} = \frac{5x-15}{3x^2+10x-8} \cdot \frac{3x^2-8x+4}{x^2+x-12}$$

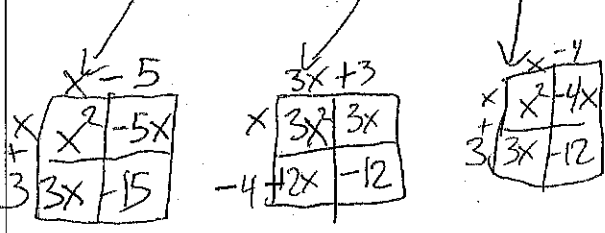
$$= \frac{5(\cancel{x-3})}{(\cancel{3x-2})(x+4)} \cdot \frac{(\cancel{3x-2})(x-2)}{(x+4)(\cancel{x-3})}$$

$$= \frac{5(x-2)}{(x+4)^2}$$



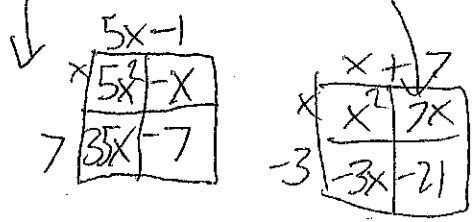
D: $x \neq \frac{2}{3}, -4, 3$

$$7. \frac{12x-18}{x^2-2x-15} \cdot \frac{x^2-x-12}{3x^2-9x-12} = \frac{6(2x-3)}{(x+3)(x-5)} \cdot \frac{(x+3)(x-4)}{(3x+3)(x+4)} = \frac{6(2x-3)}{(x-5)(3x+3)}$$



D: $x \neq -3, 5, -1, 4$

$$8. \frac{5x^2+34x-7}{10x} \cdot \frac{5x}{x^2+4x-21} = \frac{(5x-1)(x+7)}{2(x+7)(x-3)} = \frac{5x-1}{2(x-3)}$$



D: $x \neq 0, -7, 3$

$$9. \frac{5x^3-10x^2}{10x^2+40x} \div \frac{x^2-5x+6}{x^2+x-12} = \frac{5x^2-10x}{10x^2+40x} \cdot \frac{x^2+x-12}{x^2-5x+6}$$

$$= \frac{\cancel{5x}(x-2)}{2(x+4)} \cdot \frac{(x+4)(x+3)}{(x-2)(x+3)}$$

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

D: $x \neq 0, -4, 2, 3$