

Last day's work: Factoring Worksheet #3, 4, def, 6acd, 9, 10
 11gijo, 12bg [13] b

6. Factor.

a) $(x+y)^2 + 9(x+y) - 10$

$w = x+y$

$w^2 + 9w - 10$

$= (w-1)(w+10)$

$\therefore (x+y-1)(x+y+10)$

10e) $21x^2 + 17x - 30$ $\begin{array}{r|rr} a & 1 & 21 \\ 3 & 7 & | 132 \\ & 21 & | 10 \\ & & 56 \end{array}$ $= (x^2 + 4x + 5)(x^2 + 4x + 3)$
 $= (3x+5)(7x-6)$

$$\begin{array}{r} 3-5 \\ 7 \cancel{\times} 6 \\ \hline 18-35 \\ \hline -17 \end{array}$$

$$\begin{pmatrix} 3x+5 \\ 7x-6 \end{pmatrix}$$

11o) $81a^2 - (3a+b)^2$

$w = 3a+b$

$\therefore 81a^2 - w^2$

$= (9a-w)(9a+w)$

$= (9a-(3a+b))(9a+(3a+b))$

$= (9a-3a-b)(9a+3a+b)$

$= (6a-b)(12a+b)$

d) $(x^2 + 4x)^2 + 8(x^2 + 4x) + 15$

$w = x^2 + 4x$

$w^2 + 8w + 15$

$= (w+5)(w+3)$

$= (x^2 + 4x + 5)(x^2 + 4x + 3)$

11g) $80s^2 - 40s$ i) $12x^3 - 27x$
 $= 5(16s^2 - 8s)$ $= 3x(4x^2 - 9)$
 $= 5(4s+9)(4s-9)$ $= 3x(2x-3)(2x+3)$

13b) $25m^2 - \frac{1}{4}n^2$

$= \left(5m + \frac{1}{2}n\right)\left(5m - \frac{1}{2}n\right)$

12g)

Today's Learning Goal(s):

Date: Feb. 9/18
 (Every lesson)

By the end of the class, I will be able to:

- simplify a rational expression.
- state the restrictions for a rational expression .

2.4 Simplifying Rational Functions

Note: Placing "restrictions" on the variables prevents the denominator from becoming zero, because division by zero is *undefined*.

Ex.1 Simplify. State any restrictions on the variables.

a) $\frac{20}{25}$

$$= \frac{\cancel{5} \cdot 4}{\cancel{5} \cdot 5}$$

$$= \frac{4}{5}$$

No Restrictions

b) $\frac{15x^2y}{20x^3y}$

$$= \frac{5 \cdot 3}{5 \cdot 4} x^{2-3} y^{1-1}$$

$$= \frac{3}{4} x^{-1} y^0$$

$$= \frac{3}{4} \left(\frac{1}{x}\right)^1 (1)$$

$$= \frac{3}{4x} \quad R: x \neq 0 \quad y \neq 0$$

Simplify. State any restrictions on the variable.

c) $\frac{20x^2 - 25x}{15x}$ $R: x \neq 0$

$$\begin{aligned} &= \frac{5x(4x-5)}{15x} \\ &= \frac{5x \cancel{(4x-5)}}{\cancel{15x}} \\ &= \frac{4x-5}{3} \end{aligned}$$

d) $\frac{6x^2}{2x^2 - 4x}$

$$\begin{aligned} &= \frac{3 \cancel{6x^2}}{\cancel{2x}(x-2)} \\ &= \frac{3x}{x-2} \end{aligned}$$

$R: x \neq 2, 0$

e) $\frac{x^2 + 3x - 10}{4 - 2x}$

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

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

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

$$R: 2-x \neq 0$$

$$2 \neq x$$

f) $\frac{6t^2 + 7t - 5}{4t^2 - 1}$

$$\frac{(3t+5)(2t-1)}{(2t-1)(2t+1)}$$

$$\frac{3t+5}{2t+1}$$

$$R: 2t+1 \neq 0$$

$$\begin{aligned} 2t &\neq -1 \\ t &= -\frac{1}{2} \end{aligned}$$

g) $\frac{6x^2 - xy - y^2}{2x^2 - 3xy + y^2}$

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

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

$$\begin{aligned} x-y &\neq 0 \\ x &\neq y \\ x-y &\neq 0 \quad \wedge \quad 2x-y \neq 0 \\ 2x &\neq y \\ x &\neq \frac{y}{2} \end{aligned}$$

Ex.2 Evaluate $\frac{x^2 + 3x - 10}{4 - 2x}$ for:

a) $x = 3$

$$\begin{aligned} &= \frac{(3)^2 + 3(3) - 10}{4 - 2(3)} \\ &= \frac{9 + 9 - 10}{4 - 6} \\ &= \frac{-2}{2} \\ &= -1 \\ &= -4 \end{aligned}$$

b) $x = 2$

$$\begin{aligned} &= \frac{(2)^2 + 3(2) - 10}{4 - 2(2)} \\ &= \frac{4 + 6 - 10}{4 - 4} \\ &= \frac{0}{0} \text{ undefined.} \end{aligned}$$

👉 "Restrictions" on the variable **MUST** be determined, even if not asked for directly.

Are there any Homework Questions you would like to see on the board?

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11gijo, 12bg [13]

Today's Homework Practice includes:

pp. 112-114 #(1 – 7)ace, 10
[16, 17]

If finished, you may wish to work ahead on tomorrow's work:

pp. 122-123 #(4 – 7)ac, 8, 9, 11 [13]