

WEBASSIGN

(13)  $\frac{7}{3x+1} - \frac{27x}{3x-1} = -9$

LCM:  $(3x+1)(3x-1)$

$$\frac{7}{3x+1} \cdot \frac{(3x+1)(3x-1)}{1} - \frac{27x}{3x-1} \cdot \frac{(3x+1)(3x-1)}{1} = -9(3x+1)(3x-1)$$

$$7(3x-1) - 27x(3x+1) = -9((3x)^2 - (1)^2)$$

$$21x - 7 - 81x^2 - 27x = -9(9x^2 - 1)$$

$$-6x - 7 - 81x^2 = -81x^2 + 9$$

$$-6x - 7 = 81x^2 - 81x^2 + 9$$

$$-6x = 9 + 7$$

$$-6x = 16$$

$$x = \frac{16}{-6} = -\frac{8}{3}$$

(14)  $\frac{1}{x-4} + \frac{9}{x+9} = \frac{10}{x^2+5x-36}$  ← factor this polynomial.

LCM:  $(x-4)(x+9) = x^2 - 4x + 9x - 36 = x^2 + 5x - 36$

$$\frac{1}{x-4} \cdot \frac{(x-4)(x+9)}{1} + \frac{9}{x+9} \cdot \frac{(x-4)(x+9)}{1} = \frac{10}{x^2+5x-36} \cdot \frac{(x-4)(x+9)}{1}$$

$$x+9 + 9(x-4) = 10$$

$$x+9+9x-36 = 10$$

$$10x - 27 = 10$$

$$10x = 10 + 27$$

$$x = \frac{37}{10}$$

(1) Find LCM (least common multiples denominator) of denominators

(2) multiply every term with LCM.

$$\frac{1}{x-4} + \frac{9}{x+9} = \frac{1 \cdot (x+9)}{(x-4)(x+9)} + \frac{9(x-4)}{(x-4)(x+9)}$$

$$\Rightarrow \frac{x+9+9x-36}{(x-4)(x+9)} = \frac{10}{(x-4)(x+9)}$$

$$x+9x+9-36=10$$

$$10x = 37$$

$$x = \frac{37}{10}$$

-X! REMEMBER THE DOMAIN.

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

→  $x \neq -4$  (domain restriction)

$$\frac{x+4}{x+4} = 2$$

$$1 = 2$$

NOT a true statement, so no solution.

-or- LCM :  $x+4$ .

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

$$x+4 = 2(x+4)$$

$$x+4 = 2x+8$$

$$4 = x+8$$

$$-4 = x$$

BUT !!  $x \neq -4$  from domain restriction.

so there is still no solution.

Everytime you see an expression with fractions, always make a note of the domain restriction.