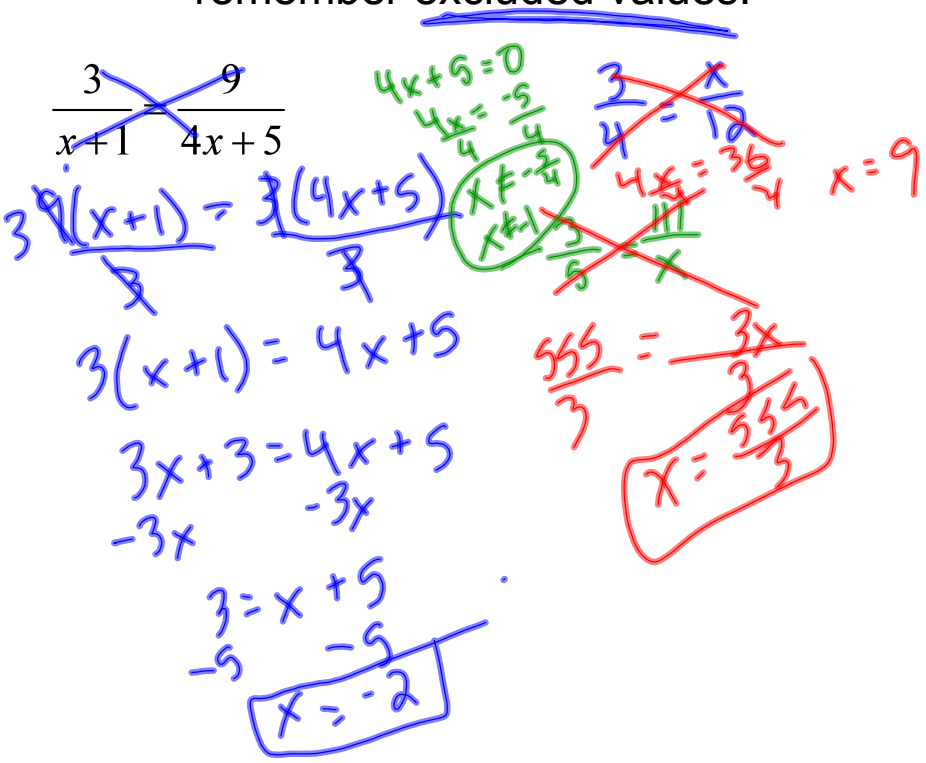
Chapter 8.6: Solve Rational Equations

- remember excluded values.



An alloy is formed by mixing two or more metals. Sterling silver is an alloy composed of 92.5% silver and 1.5% copper by weight. Jewelry silver is composed of 80% silver and 20% copper by weight. How much per silver should you mix with 15 ounces of jewelry silver to make sterling silver?

$$\frac{5}{4x}+\frac{7}{4}=\frac{-9}{x}$$

$$\left(\frac{5}{x}+\frac{7}{4}=\frac{-9}{x}\right)4x$$

$$\frac{20+7x}{4x}=\frac{-9}{x}$$

$$20+7x=-36$$
$$-20\qquad -20$$

$$-36x=x(20+7x)$$

$$-36x=20x+7x^2$$

$$7x^2+56x=0$$

$$x(7x+56)=0$$

$$\frac{7x}{7}=\frac{-56}{7}$$

$$x=-8$$

$$\left(1-\frac{8}{(x-5)}=\frac{3}{x}\right)(x-5)(x)$$

$$(x-5)(x)-8x=3(x-5)$$

$$x^2-5x-8x=3x-15$$
$$-3x\qquad +15\quad -3x+15$$

$$x^2-16x+15=0$$

$$(x-1)(x-15)=0$$

$$x=15,1$$

$$\left(\frac{6}{x-3}=\frac{8x^2}{x^2-9}-\frac{4x}{x+3}\right)(x+3)(x-3)$$

$x \neq 3, -3$

$6(x+3) = 8x^2 - 4x(x-3)$

$6x + 18 = 8x^2 - 4x^2 + 12x$

$6x + 18 = 4x^2 + 12x$

$4x^2 + 6x - 18 = 0$

$2\left(\frac{2}{2}x^2 + 3x - \frac{9}{3}\right) = 0$ $\quad \frac{18}{3} = 6$

$2(2x-3)(x+3)$

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

From 1995 through 2003, the annual sales S(in billions of dollars) of entertainment software can be modeled by the equation where t is the number of years since 1995. For which year were the total sales of entertainment software about $5.3 billion?

$$S(t) = \frac{848t^2 + 3220}{115t^2 + 1000}, 0 \le t \le 8$$

Homework: Chapter 8.6 pg. 593
#'s 6,8,10,16,18,22,24,28,34