6.5 Solving Equations w/ Rational Expressions

$$\frac{12}{3x^2+12x} - \frac{1}{1} = \frac{1}{x+4}$$

LCD: $3x(x+4)$

$$12 - 1(3x)(x+4) = 1(3x)$$
$$-1(3x^2+12x)$$

$$12 - 3x^2 - 12x = 3x$$
$$-3x^2 - 12x - 3x + 12 = 0$$
$$-3x^2 - 15x + 12 = 0$$
$$3x^2 + 15x - 12 = 0$$
$$3(x^2+5x-4) = 0$$
$$3(x$$

Say that

$$3(x^2+5x+4) = 0$$
$$3(x+1)(x+4)$$
$$x+1 = 0 \qquad x+4 = 0$$
$$x = -1 \qquad x = -4$$

$3 \neq 0$

$(5x)(x+4)$

$3x \neq 0 \qquad x+4 \neq 0$

$x \neq 0 \qquad x \neq -4$

LCD: 12

$$\frac{2}{3}x + \frac{3}{4} = \frac{1}{2}$$
$$8x + 9 = 6$$
$$-9 \quad -9$$
$$8x = -3$$
$$x = -\frac{3}{8}$$

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

$$\frac{12}{9-a^2} + \frac{3}{3+a} = \frac{2}{3-a}$$

$(3+a)(3-a)$

$$12 + 3(3-a) = 2(3+a)$$
$$12 + 9 - 3a = 6 + 2a$$
$$21 - 3a = 6 + 2a$$
$$-3a \qquad +3a$$
$$21 = 6 + 5a$$
$$-6 \quad -6$$
$$15 = 5a$$
$$3 = a$$

no solution

$\varnothing$

6.6

LCD xyz $\quad \frac{1}{x} + \frac{1}{y} = \frac{1}{z}$ solve for y

$yz + xz = xy$

$yz - xy = -xz$

$\frac{y(z-x)}{z-x} = \frac{-xz}{z-x}$

$y = \frac{-xz}{z-x}$

Work - rate

Tom can paint a fence in ? hrs.
Huck can paint the same fence in 4 hr.

How long will it take to paint the fence if they both work together?

Tom	7
Huck	4
together	x

1 hr $\quad$ tom + huck

LCD $28x$ $\quad \frac{1}{7} + \frac{1}{4} = \frac{1}{x}$

$4x + 7x = 28$

$11x = 28$

$x = \frac{28}{11}$ hrs $\quad$ 2.54 $\quad 2\frac{6}{11}$ hrs

6.1, 6.2 6.3, 6.4, 6.5, 6.6.

6.4 Long division of polynomials

$$25 \overline{)4968} \quad 198\ \tfrac{18}{25}$$

-25

246

225

218

200

18

$$x+3 \overline{)x^3+3x^2-4x+1} \quad x^2 - 4 + \frac{13}{x+3}$$

$\ominus x^3 \oplus 3x^2$ $\quad x^2(x+3)$ $\quad x^3+3x^2$

$-4x+1$

$\oplus -4x \oplus 12$

13

$$\frac{2x^4-3x^3+5x^2-x+2}{x-1} \qquad \frac{2x^4}{x} = 2x^3 \qquad 2x^3(x-1)$$

$$x-1 \overline{)2x^4-3x^3+5x^2-x+2} \quad 2x^3-x^2+4x+3+\frac{5}{x-1}$$

$\ominus 2x^4 \oplus 2x^3$

$-x^3+5x^2$

$\oplus -x^3 \mp x^2$

$4x^2-x$

$\ominus 4x^2 \oplus 4x$

$3x+2$

$\ominus 3x \oplus 3$

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Synthetic division – (Linear divisor only)

x^4

$x-1=0$ | 1 | 2 | −3 | 5 | −1 | 2

$x=1$ | | ↓ | 2 | −1 | 4 | 3

	2	−1	4	3	5
	x^3	x^2	x	#	R

$\frac{2x^4}{x} = 2x^3$

$2x^3 - 1x^2 + 4x + 3 + \frac{5}{x-1}$

$\frac{x^3-1}{x-1}$

$x-1 \overline{)\, x^3 - 1}$ $\quad x^2$

$x^3 - x^2$

out of alignment

(NO)

$x-1 \overline{)\, x^3 + 0x^2 + 0x - 1}$ $\quad x^2 + x + 1$

$\ominus x^3 \oplus x^2$

$x^2 + 0x$

$\ominus x^2 \oplus x$

$x - 1$

$\ominus x \oplus 1$

0

in alignment yes.

x^3

$x-1=0$ | 1 | 1 | 0 | 0 | −1

$x=1$ | | ↓ | 1 | 1 | 1

	1	1	1	0
	x^2	x	#	R

$x^2 + x + 1$

$$\frac{3x^2y + 5xy^2 - 3x + 2}{x}$$

monomial division

$$\frac{3x^2y}{x} + \frac{5xy^2}{x} - \frac{3x}{x} + \frac{2}{x}$$

$$3xy + 5y^2 - 3 + \frac{2}{x}$$

Test Review Ch 6

20 questions

Domain	(2)		
factor a cube (x^3)	(1)		
write in lowest term (factor / cancel)	(2)		
multply / divide	(3)	6.1	
add / subtract	(3)	6.2	
complex fraction	(2)	6.3	
monomial division	(1)	6.4	
binomial division	(1)	6.4	
solve equation	(3)	6.5	check / answer
solve for variable	(1)	6.6	
work / rate problem	(1)		