

# Review

## Order of Operations

P

E

MD

AS

## Number Systems

$\mathbb{N}$  = natural #s =

$\mathbb{W}$  = whole #s =

$\mathbb{Z}$  = integers =

$\mathbb{Q}$  = rational numbers =

irrational numbers

$\mathbb{R}$  = real numbers

## Flow chart

## Review (cont)

### Interval Notation

$$-\infty < x < a, \quad (-\infty, a)$$

$$a < x < \infty, \quad (a, \infty)$$

$$a < x < b, \quad (a, b)$$

$$a \leq x \leq b, \quad [a, b]$$

$$a \leq x < b, \quad [a, b)$$

$$a < x \leq b, \quad (a, b]$$

Ex 1  
Evaluate (a)  $\frac{(-5)(-3) - (-2)(4)}{-9+2}$

(b)  $\frac{|3 - |4 - 11||}{-|5^2 - 3^2|}$

## Review (cont)

### Rules of Exponents

### Example

$$\textcircled{1} a^0 = 1 \quad \underline{\text{if}} \quad a \neq 0$$

$$\textcircled{2} a^m a^n = a^{m+n}$$

$$\textcircled{3} \frac{a^m}{a^n} = a^{m-n} \quad (a \neq 0)$$

$$\textcircled{4} (ab)^m = a^m b^m$$

$$\textcircled{5} \left(\frac{a}{b}\right)^m = \frac{a^m}{b^m}$$

$$\textcircled{6} (a^m)^n = a^{mn}$$

$$\textcircled{7} a^{-n} = \frac{1}{a^n} \quad (a \neq 0)$$

★  $0^0$  undefined ... but why?

Review (cont)

Ex 2 Simplify

(a)  $(-32x^5)^{-3}$

(b)  $\left(\frac{-2}{5}\right)^{-4}$

(c)  $\left(\frac{4x^{-1}y^{-15}}{2^{-2}x^5y^{-5}}\right)^{-2}$

(d)  $(-8a^{-3}b^2c) \div (2a^5b^4)$

## Review (cont)

### Rational Exponents

$$\textcircled{1} \sqrt[n]{a} = b \Leftrightarrow a = b^n \quad (\text{principal } n^{\text{th}} \text{ root})$$

$$\textcircled{2} a^{1/n} = \sqrt[n]{a}$$

$$\textcircled{3} a^{m/n} = \sqrt[n]{a^m} = (\sqrt[n]{a})^m$$

Ex 3 Simplify

(a)  $(-8)^{-2/3}$

(b)  $(x^{-2/3})^{-2/5}$

(c)  $\sqrt{32x^5y^2}$  (assume  $y > 0$ )

## Review (cont)

Polynomials  $a_n x^n + a_{n-1} x^{n-1} + \dots + a_2 x^2 + a_1 x + a_0$

$n = \text{degree}$

$a_i$  is  $i^{\text{th}}$  coefficient

$a_n = \text{leading coefficient}$

$$a_i \in \mathbb{R}$$

Ex 4 Simplify

(a)  $2(x^3 + 3)(2x^2 - 5)$

(b) 
$$\frac{16x^2 + 4xy^2 + 8x}{4xy}$$

Review (cont)

Ex 5 Factor completely.

(a)  $x^2 + 6x + 8$

(b)  $4x^2 - 8x - 60$

(c)  $x^4 - 3x^2 - 4$

# 1.1 Linear Equations in One Variable

Vocab

equation

vs.

expression

identity

equivalent equations  
(same as "keeping the  
balance scale balanced")

Solve equations and simplify expressions

Ex 1 Solve.

(a)  $3x + 22 = 7x + 2$

(b)  $\frac{2}{3}x - 1 = \frac{x-2}{2}$



1.1 (cont)

Ex 2 Simplify.

(a)  $3(x-1) + 2x + 5 - 7$

(b)  $4 - (2x+5) + 6 + 5(x-3)$

Ex 3 Solve these rational eqns (that turn into linear eqns). Note: check the domain.

(a)  $\frac{2x}{x-3} = 4 + \frac{6}{x-3}$

vocab

rational eqn  $\Rightarrow$

domain  $\Rightarrow$

1.1 (cont)

Ex 3 (cont)

(b)  $\frac{3}{x} + \frac{1}{4} = \frac{2}{3} + \frac{1}{x}$

EX 4 Suppose a professor counts the final exam as being equal to each of the other tests in her course, and she will also charge the lowest test score to match the final exam score if the final exam score is higher. If a student's four test scores are 83, 67, 52 and 90, what is the lowest score the student can earn on the final exam and still obtain an 80 average for the course?

1.1 (cont)

Ex 5 Three less than 4 times a number is 25.  
What is the number?

Ex 6 The perimeter of a rectangle is 700 ft and the length of the rectangle is four times as long as the width. Find the dimensions of the rectangle.