

Math 60, Monday 4/7

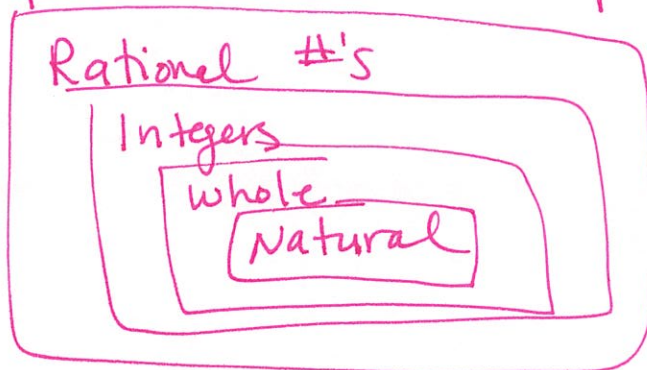
Amelia from ASPCC

Q's on 1.3

New Material 1.4

Q's on 1.3

89. Temperatures in weather reports



92. $C = 2\pi r$
↑
irrational

Irrational numbers

Section 1.4 - Basic Rules of Algebra

Expression — A combination of variables, numbers and operations (with no = sign)

ex: $\underline{x} + \underline{y}$ ← 2 terms → $3x - 1x$ or $6y + 7x$

coefficient → $\frac{3}{4}x$ ← 1 term
variable

$\underline{7y}$ ← 1 term → 3 ↑ constant term

ex: 4. $\underline{1x} + 6 + \underline{7x}$

a. 3 terms

b. 1

c. 6

d. yes, $1x$ and $7x$
 x and $7x$

Like terms:

$$\begin{aligned} 2 \text{ dogs} + 1 \text{ dog} \\ = 3 \text{ dogs} \end{aligned}$$

$$\begin{aligned} 2x + 1x \\ = 3x \end{aligned}$$

$$\begin{aligned} 8 \text{ kittens} - 5 \text{ kittens} \\ = 3 \text{ kittens} \end{aligned}$$

$$\begin{aligned} 8y - 5y \\ = 3y \end{aligned}$$

2 dogs + 7 kittens \rightarrow not like terms

$2x + 7y$ cannot be simplified
because they are not like terms

3 properties

① Commutative - changing places

$$3 + 4 \stackrel{?}{=} 4 + 3 \text{ yes addition is commutative}$$

$$3 - 4 \neq 4 - 3 \text{ no, subtraction is not commutative}$$

$$3 \cdot 4 = 4 \cdot 3 \text{ mult is commutative}$$

$$3 \div 4 \neq 4 \div 3 \text{ no, division is not commutative}$$

② Associative - who you associate with
()

$$\begin{array}{ccc} (3+4) + 2 & = & 3 + (4+2) \\ \begin{array}{c} 7+2 \\ 9 \end{array} & & \begin{array}{c} 3+6 \\ 9 \end{array} \end{array} \quad \begin{array}{l} \text{Addition is} \\ \text{associative} \end{array}$$

$$(3-4) - 2 \neq 3 - (4-2) \quad \begin{array}{l} \text{subtraction is} \\ \text{not associative} \end{array}$$

$$\begin{array}{ccc} (3 \cdot 4) \cdot 2 & = & 3(4 \cdot 2) \\ \begin{array}{c} 12 \cdot 2 \\ 24 \end{array} & & \begin{array}{c} 3 \cdot 8 \\ 24 \end{array} \end{array} \quad \begin{array}{l} \text{mult is associative} \end{array}$$

Division is not associative

③ Distributive

$$\begin{array}{ccc} 3(6+1) & = & 3 \cdot 6 + 3 \cdot 1 \\ \begin{array}{c} 3 \cdot 7 \\ 21 \end{array} & & \begin{array}{c} 18 + 3 \\ 21 \end{array} \end{array}$$

$$\begin{array}{l} \text{ex: } 4 \cdot (x+2) \\ = 4x + 8 \end{array}$$

$$\begin{array}{l} 36. \quad 4 \cdot (x-5) \\ 4x - 20 \end{array}$$

$$\begin{array}{l} 40. \quad \frac{1}{3}(7x-21) \\ = \frac{7}{3}x - 7 \end{array}$$

Simplifying Algebraic Expressions

$$\begin{array}{l} 48. \quad \underline{5x} + \underline{13x} \\ = 18x \end{array}$$

$$\begin{aligned}
 52. \quad & 7 + (x + 10) \\
 & = 7 + (10 + x) \quad \leftarrow \text{commutative prop} \\
 & = (7 + 10) + x \quad \leftarrow \text{associative prop.} \\
 & = 17 + x
 \end{aligned}$$

$$\begin{aligned}
 & 7 + (x + 10) \\
 & = \underline{7} + x + \underline{10} \\
 & = 17 + x
 \end{aligned}
 \quad \left\{ \begin{array}{l} \text{different example} \\ 7 + 3(x + 10) \quad \text{Dist.} \\ = 7 + 3x + 30 \\ = 37 + 3x \end{array} \right.$$

Math model

$$\begin{aligned}
 78. \quad W &= 2(2n + 20) + .3(n + 20) \\
 &= \underline{4n} + \underline{40} + \underline{.3n} + \underline{6}
 \end{aligned}$$

$$a) \quad = 4.3n + 46$$

b) Base year is 2000 so 2005 is $n = 5$

$$\begin{aligned}
 W &= 4.3(5) + 46 \\
 &= 21.5 + 46 \\
 &= 67.5\%
 \end{aligned}$$

The percentage of US women who used the Internet in 2005 was 67.5%. This model ~~over~~^{under}estimates the data by 1.5%.

Class Mixer - Simplifying Expressions

Walk around the room and simplify each expression with a **different partner**. Choose people you don't know yet. You may ask other pairs for help. Sign each others' papers when you agree on an answer.

Problem	Partner
54. $\underline{8y} + 7 + \underline{10y}$ $= 18y + 7$	
56. $\underline{7x} + \underline{8} + \underline{2x} - \underline{3}$ $= 9x + 5$	
58. $\underline{13a} + \underline{15} + \underline{2a} + \underline{11}$ $= 15a + 26$	
60. $2(5x + 4) - 3$ $= \underline{10x} + \underline{8} - \underline{3}$ $= 10x + 5$	
62. $14 + 2(5x - 1)$ $= \underline{14} + \underline{10x} - \underline{2}$ $= 12 + 10x$	
64. $11(6a + 3b) + 4(12a + 5b)$ $= \underline{66a} + \underline{33b} + \underline{48a} + \underline{20b}$ $= 114a + 53b$	

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Problem	Partner
54. $8y + 7 + 10y$	
56. $7x + 8 + 2x - 3$	
58. $13a + 15 + 2a + 11$	
60. $2(5x + 4) - 3$	
62. $14 + 2(5x - 1)$	
64. $11(6a + 3b) + 4(12a + 5b)$	