1.4 (61) c $x + y - 4$

c) $(-\frac{3}{5}) + (\frac{8}{5}) - 4$

$\frac{5}{5} - 4$

$1 - 4$

-3

difference between 73 & 75

↳ The difference of -8 and 5.

$-8 - 5$

-13

(75) The difference of 8 and -5

$8 - (-5)$ $\quad -- \to +$

$8 + 5$

13

1.3 ① 3 and 5

$$-3 + 5$$

$$2$$

$$-3 + (-5)$$

$$-8$$

$$3 + 5$$

$$8$$

$$3 + (-5)$$

$$-2$$

1.6 (41) $7 - 2[-6 - 4(-3)]$

$7 - 2(-6 + 12)$

$7 - 2(6)$

$7 - 12$

-5

$\frac{15}{4}$ improper fraction

(83) $-\frac{1}{3}(-2x + 6)$

$-\frac{1}{3}(-2x) - \frac{1}{3}\left(\frac{6}{1}\right)$

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

$-\frac{1}{3}\left(\frac{6}{1}\right)$

$-\frac{6}{3} = -\frac{2}{1} = -2$ can be reduced

---

(84) $\frac{2x}{2} = \frac{7}{2}$

$x = \frac{7}{2}$

1.5 Properties of Numbers

It does not matter in which order you add numbers

i.e. $a + b = b + a$

Commutative Property of addition

Multiplication

$ab = ba$

Commutative Property of Multiplication

(ex) Simplify

$4 + x + 2$

$4 + 2 + x$

$6 + x$

We CAN specify which to do first by grouping (associating) the numbers with grouping symbols

Addition $a + (b + c) = (a + b) + c$

Multiplication $ab(c) = a(bc)$

$(ab)c = a(bc)$

$a + (b + c) = (a + b) + c$

Associative Property

(ex) $3 + (2 + x) = (3 + 2) + x$

$= 5 + x$

(ex) $5(2x) = (5 \cdot 2)x$

$= 10x$

The Distributive Property

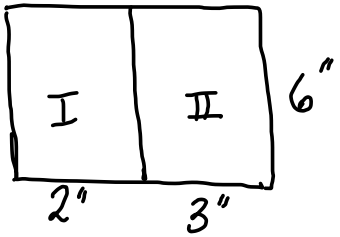
$$a(b+c) = ab + ac$$

Multiplication distributes over addition

$$t(a+b+c) = ta + tb + tc$$

$$ta + tb + tc = t(a+b+c)$$

Really works



What is the area?

① $l \cdot w = 6(2+3)$

$= 6(5)$

$= 30$

② Add area of both rectangles

$A = 2 \cdot 6 + 3 \cdot 6$

$= 12 + 18$

$= 30$

Special Numbers -

Additive Identity is zero

$$a + 0 = 0 + a = a$$

Multiplicative Indentity

$$a \cdot 1 = 1 \cdot a = a$$

The Inverse

Additive Inverse -

$$a + (-a) = 0$$

Multiplicative Inverse

$$a\left(\frac{1}{a}\right) = \frac{a}{a} = 1$$

same as reciprocal

$\{\ \}$ braces - use these to indicate we have a set

Set - a list of things

$\in$

is an element

members

$\heartsuit \notin \{\square, \triangle, \bigcirc\}$

roster notation - list all elements inside braces

$B = \{ x \mid x \text{ is a vowel} \}$

Set builder notation

$A = \{a, e, i, o, u\}$

$A = B$

.

Two special sets

universal set U

empty set $\{\}$, $\emptyset$

$U = \{x \mid x \text{ is a letter of the alphabet}\}$

---

subsets $A \subseteq U$ $A \subseteq B$

$B \subseteq A$

$A \subset U$

"is a proper subset of"

$<$

$\leq$

$\subseteq$

$\subset$

$U = \{2, 4, 6, 8, 10\}$ ←

$A = \{2, 4, 6\}$ $\quad A \subset U$

$B = \{2, 4, 6, 8\}$

$C = \{2, 6, 10\}$ ←

$\emptyset$ is empty set

10 is not in B

$C \not\subseteq B$

element

$a \in \{a, e, i, o, u\}$

$\{a, i\} \subseteq \{a, e, i, o, u\}$

subset

$\{a, i\} \subset \{a, e, i, o, u\}$

"is a proper subset"

$3 < 5$

$3 \leq 5$

} both true

less than OR equal to

$C = \{2, 5, 7\}$

$\{\}$ (1) $\{2, 5, 7\}$ (2)

$\{2\}$ (3), $\{5\}$ (4), $\{7\}$ (5)

$\{2, 5\}$ (6), $\{2, 7\}$ (7), $\{5, 7\}$ (8)

$D = \{2, 5\}$

$\{0\}$ $\{\}$

subsets $\{\}$ $\{2, 5\}$, $\{2\}$, $\{5\}$

$2^{n(C)}$

$n(C) = 3$

cardinality

$2^3 = 8$

$2^2 = 4$

how many

$$E = \{1, 2, 3, 4, 5, 6, 7, 8\}$$

$$2^8 = 256$$

2 ^ 8

x^y

2 x^y 8

---

one-to-one

$A = \{1, 2, 3\}$

$B = \{a, b, c\}$

1 - a

2 - b

3 - c

Venn Diagrams

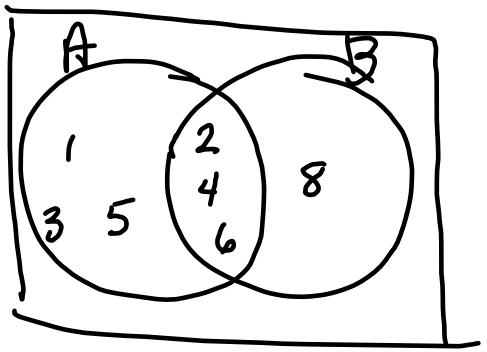
$A \cap B$

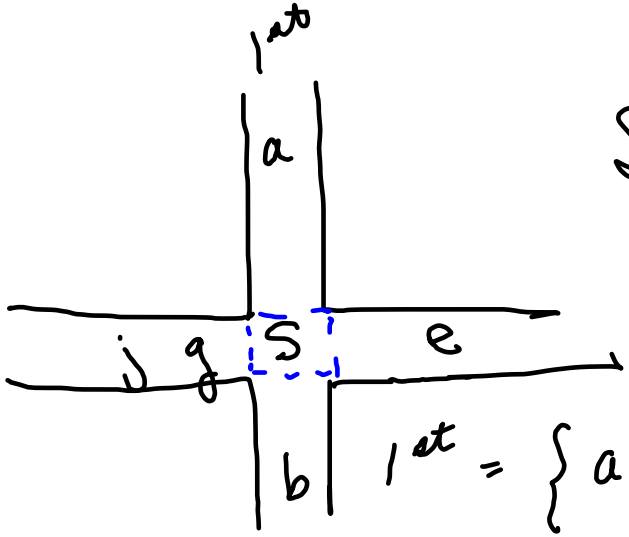
$A = \{1, 2, 3, 4, 5, 6\}$

$B = \{2, 4, 6, 8\}$

$A \cap B = \{2, 4, 6\}$

intersect





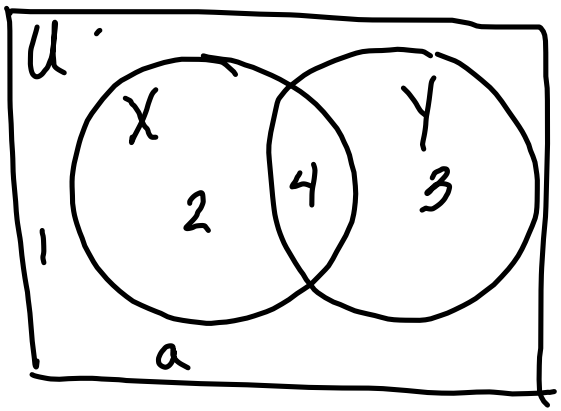
Streets

Main

$1^{st} = \{a, s, b\}$

$Main = \{j, g, s, e\}$

intersection $= \{s\}$



$A \cup B$

"union"

$A \cap B$

Go to mathsci.solano.edu

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Math 330 E A Spring 2012