



**AAMMP UP**   
 Arizona Aviation, Mining and Manufacturing Program

**Utility Industry  
 Math Boot Camp**

Welcome!  
 2015 Summer Course


**AAMMP UP**   
**Utility Industry  
 Math Boot Camp**  
 2015 Summer Course

**AAMMP UP Math and Test  
 Prep Workshop**

To increase the skill level in  
 applied math.

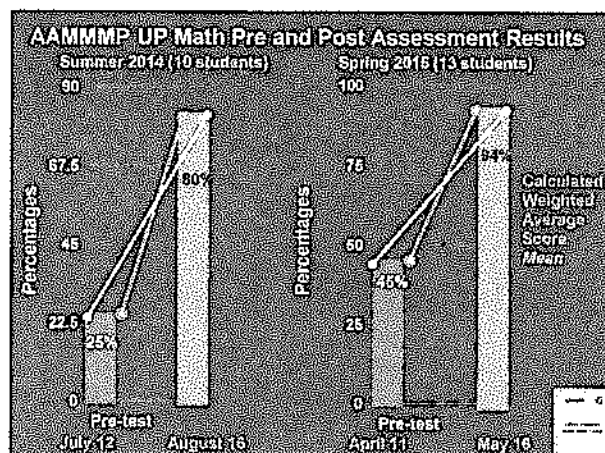
6 day workshop with the  
 final day designated as  
 Test Preparation (post-test).

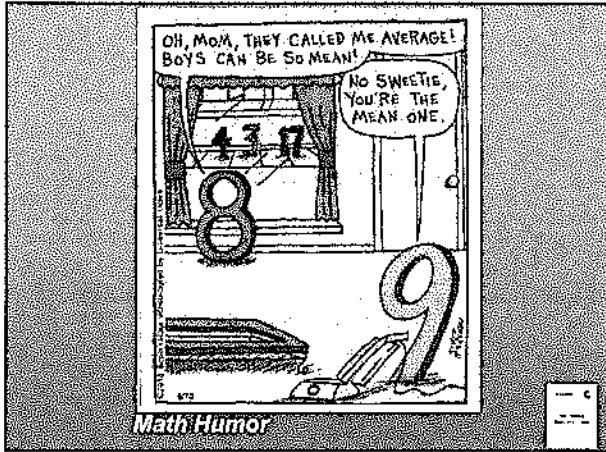
**When?**  
**Saturdays**  
**June 06, 13, 20, 27**  
**July 11 and 18**  
**9:00 am - noon**

**AAMMP UP**   
**Utility Industry  
 Math Boot Camp**  
 2015 Summer Course

**Workshop will consist of:**  
 Instructor guide  
 Student practice  
*math quizzes online*  
*practice problems*  
*exercises in groups*

**Online quizzes**  
*math concepts*  
*mechanical concepts*  
*spatial reasoning*  
*graphic mathematics*  
*reading comprehension*





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**Utility Industry Math Boot Camp**

2018 Summer Course

**Saturdays from June 06 to July 18**

- June 06 - 08:00-10:00 AM
- June 13 - 08:00-10:00 AM
- June 15 - 10:00-12:00 Noon
- June 20 - Ratios, proportions and percents
- June 27 - Dimensions Analysis aka Mathematical Usage
- July 11 - Geometry and Graphic Mathematics
- July 18 - Review post test

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**Utility Industry Math Boot Camp**

2018 Summer Course

**Saturdays from June 06 to July 18**

- June 06 - A130
- June 13 - A130
- June 20 - A130
- June 27 - A130
- July 11 - A270 (upstairs)
- July 18 - A130

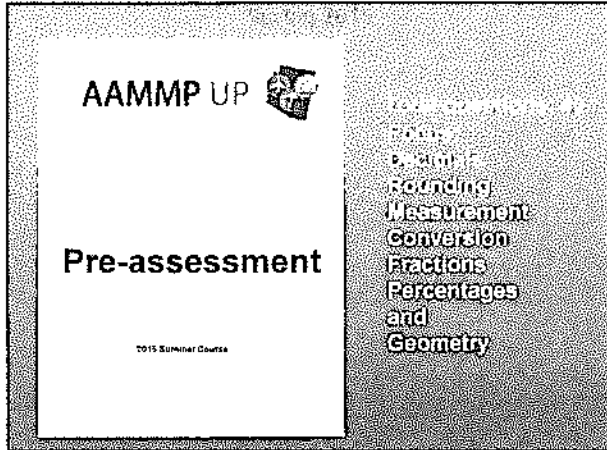
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**Utility Industry Math Boot Camp**

2018 Summer Course

**Focus Area: Utility Math**

- June 06 - 08:00-10:00 AM
- June 13 - 08:00-10:00 AM
- June 15 - 10:00-12:00 Noon
- 10:20 - 11:50 Digits // Numbers Rounding // Decimals
- 11:50 - 12:00 Exit Ticket

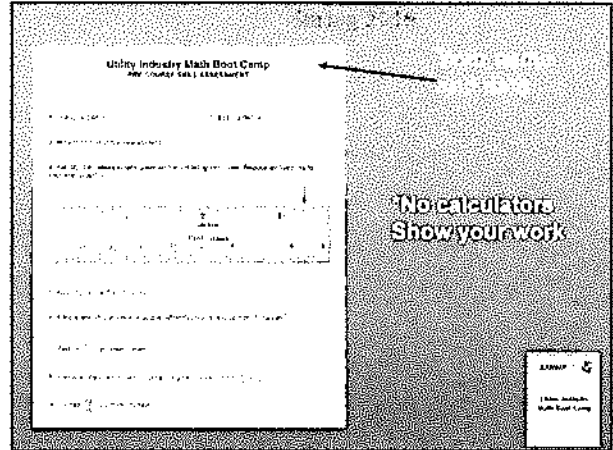


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**Pre-assessment**

2015 Summer Course


Topics covered include:  
Rounding  
Measurement  
Conversion  
Fractions  
Percentages  
and  
Geometry



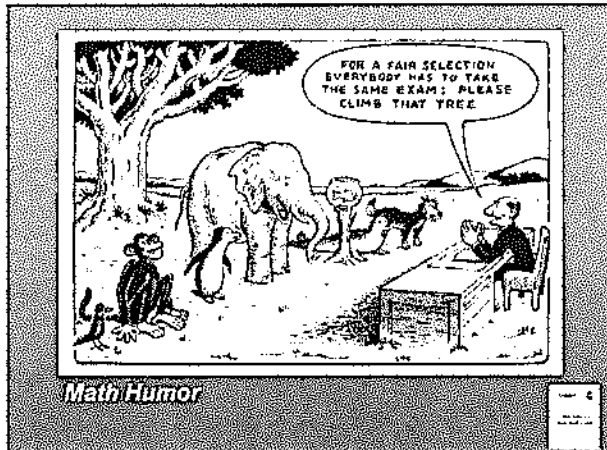
Utility Industry Math Boot Camp  
New Chapter Math Assessment

**No calculators  
Show your work.**

1. Find the sum of the following numbers.  
2. Find the difference of the following numbers.  
3. Find the product of the following numbers.  
4. Find the quotient of the following numbers.  
5. Find the perimeter of the following rectangle.  
6. Find the area of the following rectangle.  
7. Find the volume of the following rectangular prism.  
8. Find the surface area of the following rectangular prism.  
9. Find the circumference of the following circle.  
10. Find the area of the following circle.

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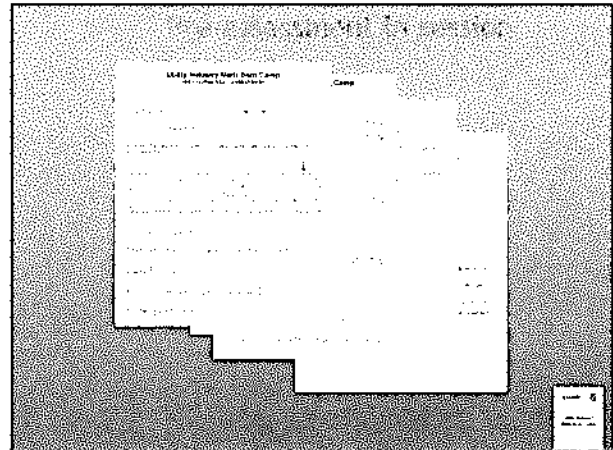
Utility Industry Math Boot Camp



FOR A FAIR SELECTION EVERYBODY HAS TO TAKE THE SAME EXAM: PLEASE CLIMB THAT TREE.

**Math Humor**


**C**



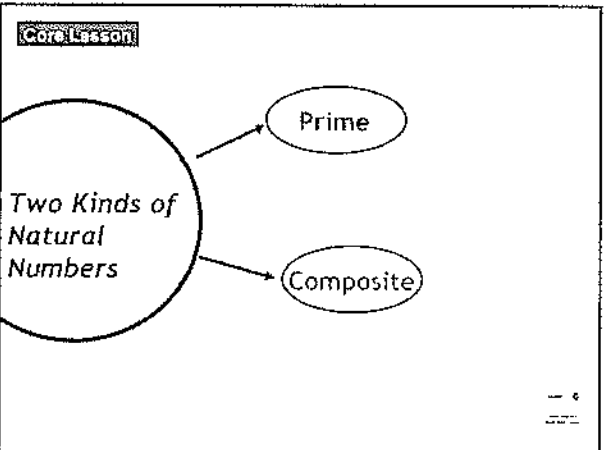
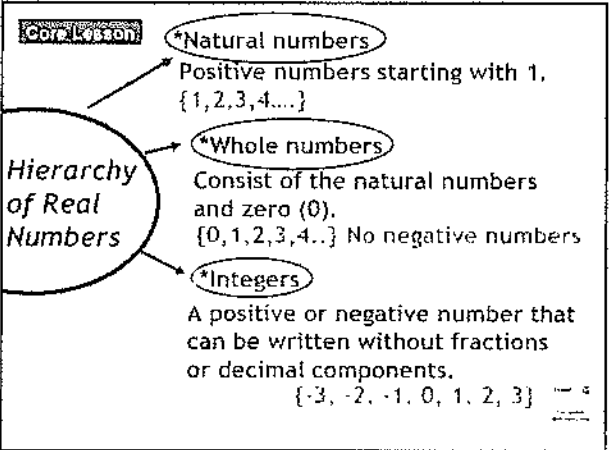
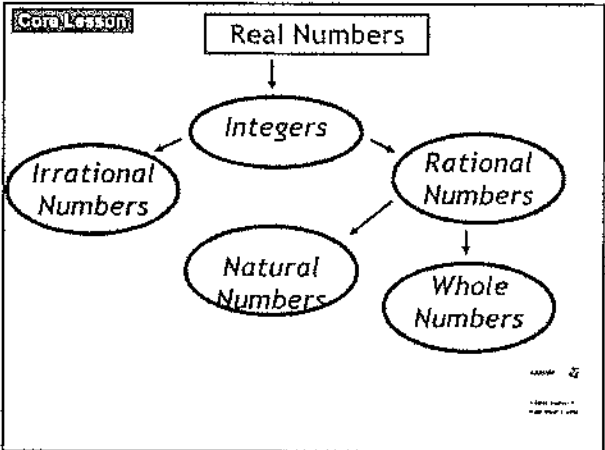
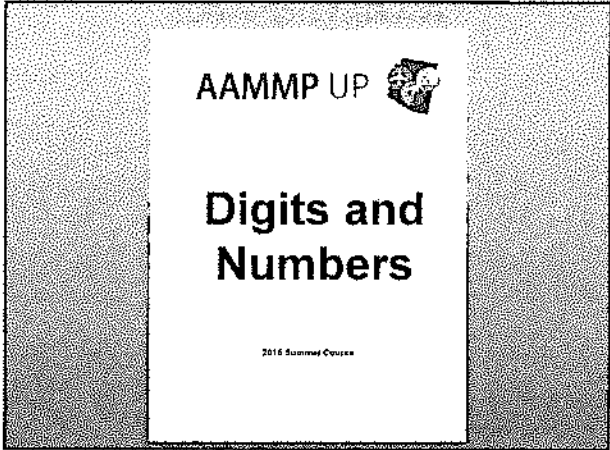
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6. Find the area of the following rectangle.  
7. Find the volume of the following rectangular prism.  
8. Find the surface area of the following rectangular prism.  
9. Find the circumference of the following circle.  
10. Find the area of the following circle.

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**Core Lesson**

**Two Kinds of Natural Numbers**

**Prime**

A prime number has only two factors: itself and one (1).  
 \*One (1) is neither a prime or a composite number; it is a special number that has only itself for a factor.

**composite**

**Core Lesson**

**Two Kinds of Natural Numbers**

**Prime**

**composite**

A composite is any number greater than one (1) that is not a prime number.

**Natural Numbers**

Prime and numbers

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

$17$  Prime number  
 $42$  Composite number  
 Prime factors:  
 $30 = 3 \times 6$   
 $6 = 3 \times 2$   
 $30 = 5 \times 3 \times 2$

**Practice**

**Digits and Numbers Practice Activity**

Utility Industry Math Boot Camp

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AACTEP

Utah Industry High School Camp

Circle numbers that are prime numbers.  
 Cross out all even numbers.

**Practice** *Digits and Numbers Practice Activity*  
**Answers - Circle numbers that are prime numbers. Cross out all even numbers.**

15	16	17	18	19	20	21	22	23	24	25	26	27	28
29	30	31	32	33	34	35	36	37	38	39	40	41	42
43	44	45	46	47	48	49	50	51	52	53	54	55	56
57	58	59	60	61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80	81	82	83	84
85	86	87	88	89	90	91	92	93	94	95	96	97	98
99	100												

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**Resource**

Graphic Organizer

Real Numbers

Rational Numbers

Irrational Numbers

Integers

Whole Numbers

Natural Numbers

Real Numbers

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**Resource**

no fractions

Integers  
 -3, -2, -1, 0, 1, 2, 3, ...

Whole Numbers  
 0, 1, 2, 3, 4, 5, 6, ...

Natural Numbers  
 1, 2, 3, 4, 5, 6, ...


no decimals

Student Guide pg. 8

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Jerry, a lineworker helper, needs to determine the proper depth a 40-foot pole needs to be buried in typical soil. He determines from the construction standards that the pole base must be buried 5 feet deep, or  $\frac{1}{8}$  of the pole height. Is  $\frac{1}{8}$  a rational number or an irrational number?

**What is a rational or an irrational number?**



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**Core Lesson**

**Rational Number**

The ratio of two integers,  $x/y$

Fractions  
Decimals

$1/2 = 0.5$

\*Some fruits are rational  $\sqrt{100} = 10$

**Irrational Number**

Any real number that cannot be expressed as a ratio, where  $a$  and  $b$  are integers and  $b$  is non-zero.

$\sqrt{2}, \sqrt{3}, \sqrt{10}, \pi, e, \phi$

**Core Lesson**

**Rational Number**

- Integers**  
+/- whole numbers, including zero
- Fractions**  
 $1/2, 2/3, -3/4, 9/8, 25/7$
- Mixed number fraction**  
 $2 \frac{1}{3} = 7/3$

**Core Lesson**

**Irrational Number**

Irrational Number: A decimal that never terminates and never repeats. It must be represented with a symbol.

Symbols that represent irrational numbers.

3.27512....

The "..."  
dot  
dot  
dot

decimal continues on forever without repeating so...its an irrational number.

\*If the number stops, it's rational because it terminates

**Resource**

**Real Number Chart**

**R** Real Numbers  
All real numbers including rational and irrational numbers.

**Q** Rational Numbers  
All numbers that can be written as a fraction  $a/b$  where  $a$  and  $b$  are integers and  $b \neq 0$ .

**Irrational Numbers**  
All numbers that cannot be written as a fraction  $a/b$  where  $a$  and  $b$  are integers and  $b \neq 0$ .

**Sub-Integer Rational Numbers**  
All numbers that can be written as a fraction  $a/b$  where  $a$  and  $b$  are integers and  $b \neq 0$  and  $a < b$ .

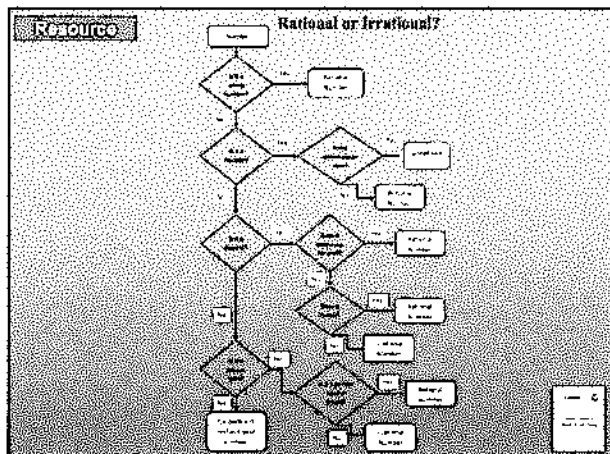
**Integers**  
All whole numbers and their opposites.

**Whole Numbers**  
All counting numbers and zero.

**Natural Numbers**  
All counting numbers.

**Zero**  
0

**Natural Numbers**  
1, 2, 3, 4, 5, ...



**Class Practice**

Which of the following are rational and irrational numbers?

- $2\pi$  → irrational *any term with an  $\pi$  is irrational*
- $3.14$  → rational *decimal terminates*
- $2.71830$  → rational *decimal terminates*
- $8.\bar{2}$  → rational *repeating numbers*
- $\sqrt{7}$  → irrational *not a perfect square root*
- $\sqrt{9}$  → rational *perfect square root of 3*
- $4.212302\dots$  → irrational *dot, dot, dot ....*

**Expanded in Group**

Sorting 20: Rational and Irrational Numbers

$\sqrt{15}$     $5.82147$   
 $-9.83333$     $-8.12345$   
 $-3/4$     $1.3333\dots$

Rational	Irrational

Directions:  
 First sort  
 Second glue the paper strip in the correct column  
 Finally explain why it is a rational or irrational number.

**Practice** Digits and Numbers Practice Activity

Fill in the blanks in the following chart. Write yes or no.

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2. Fill in the blanks in the following chart. The first one is already done as an example.

Number	Yes	No	Yes	No
$\sqrt{16}$	Yes		Yes	
$\sqrt{10}$				
$\sqrt{25}$				
$\sqrt{12}$				
$\sqrt{49}$				
$\sqrt{36}$				



**Practice** Digits and Numbers Practice Activity

Fill in the blanks in the following chart. Write yes or no.

Number	Rational	Irrational
1	yes	no
-1	yes	no
0	yes	no
$\frac{2}{5}$	yes	no
$\pi$	no	yes
0.121212	yes	no
$\frac{3}{5}$	yes	no
9.812543	no	yes
$\frac{0}{16}$	yes	no
$\sqrt{4}$	yes	no
$\sqrt{6}$	yes	no

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**Resource**


Mathematical expressions and numbers scattered on a grid:

- 15.5
- $\frac{4}{9}$
- $\frac{5}{7}$
- 17.5
- $-\frac{1}{2}$
- 3.14
- $-\frac{6}{12}$
- $\sqrt{102}$
- 5.5
- $-\frac{12}{6}$
- $-\sqrt{64}$
- 5b
- $-\sqrt{77}$
- 0
- 1
- $3\pi$
- 0.6
- 0.6
- $\sqrt{65}$
- 5.5
- $\frac{10}{5}$
- 5
- $\frac{9}{3}$
- $\pi$
- 4
- $\sqrt{1}$
- $\sqrt{49}$
- $-\pi$
- 179
- 1
- $\sqrt{100}$

Jerry, a lineworker helper, needs to determine the proper depth a 40-foot pole needs to be buried in typical soil. He determines from the construction standards that the pole base must be buried 5 feet deep, or  $\frac{1}{8}$  of the pole height. Is  $\frac{1}{8}$  a rational number or an irrational number?

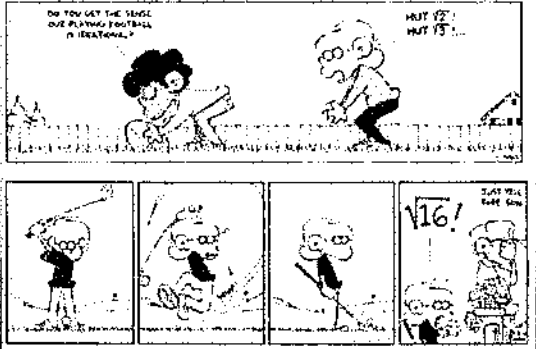
**A. irrational**  
**B. rational**  
**C. neither**  
**D. both**

$\frac{1}{8}$  has whole numbers integers denominator is not zero



DO YOU GET THE JOKE OUR PLAYING FOOTBALL IS IRRATIONAL?

HUT 12! HUT 15!



**MathHumor**

