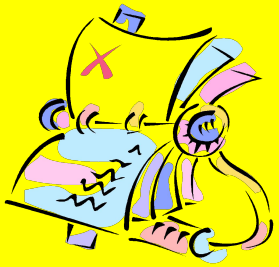
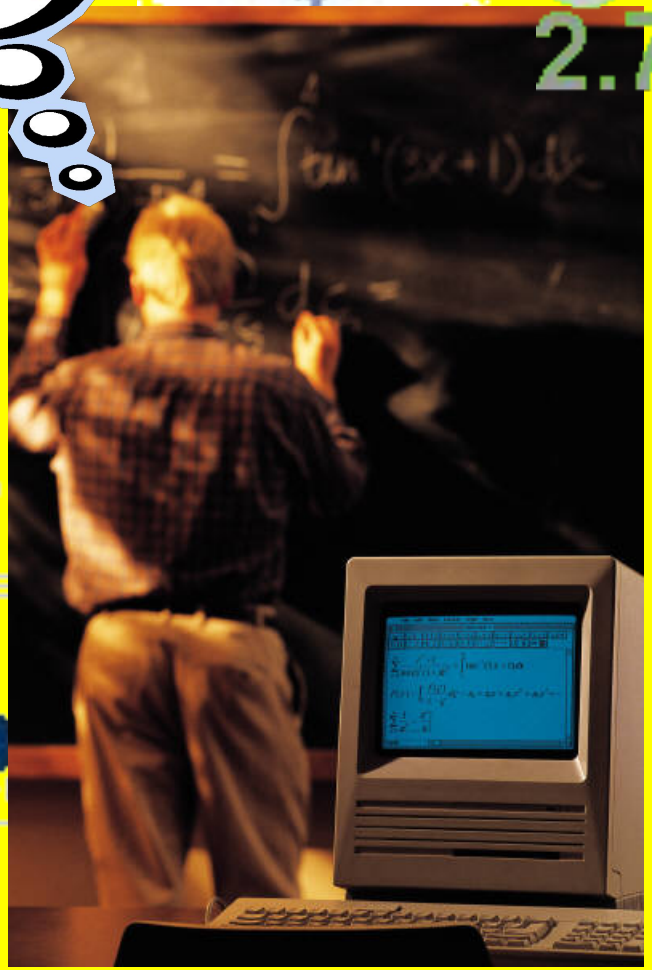
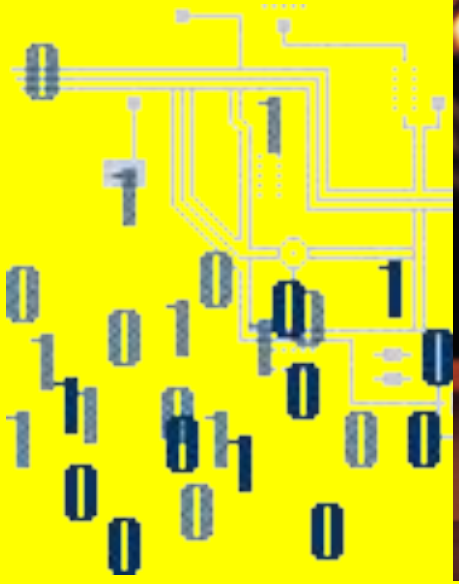
This is a powerpoint to teach number sense tricks. If you find any errors please let me know at mccoach3@aol.com

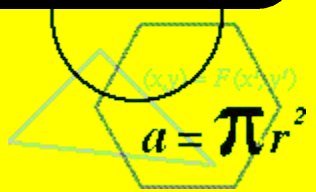
Edited by pthornton52@hotmail.com on Feb. 20, 2014

NUMBER SENSE AT A FLIP

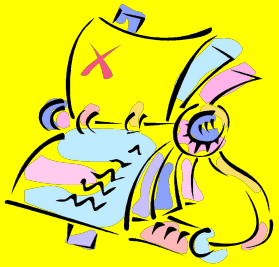


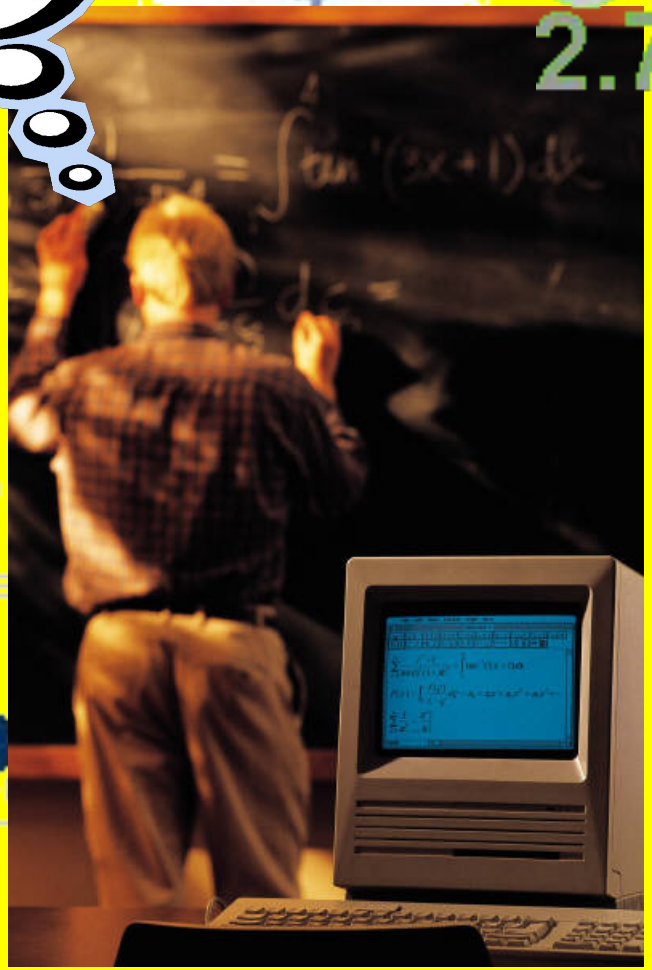


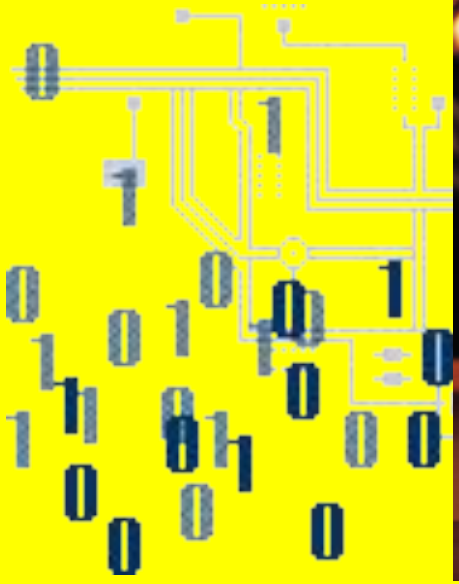


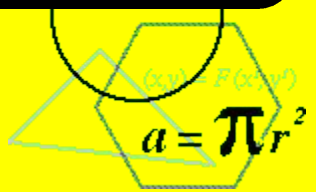


NUMBER SENSE AT A FLIP









Number Sense

Number Sense is memorization and practice. The secret to getting good at number sense is to learn how to recognize and then do the rules accurately . Then learn how to do them quickly. Every practice should be under a time limit.

The First Step

The first step in learning number sense should be to memorize the PERFECT SQUARES from $1^2 = 1$ to $40^2 = 1600$ and the PERFECT CUBES from $1^3 = 1$ to $25^3 = 15625$. These squares and cubes should be learned in both directions. ie. $17^2 = 289$ and the $\sqrt{289}$ is 17.

The Rainbow Method

2x2 Foil (LIOF)

Work Backwards

23 x 12

Used when you forget a rule about 2x2 multiplication

1. The last number is the units digit of the product of the unit's digits
2. Multiply the outside, multiply the inside
3. Add the outside and the inside together plus any carry and write down the units digit
4. Multiply the first digits together and add and carry. Write down the number

$$\underline{2(1)} \quad \underline{2(2)+3(1)} \quad \underline{3(2)}$$

$$2 \qquad 7 \qquad 6$$

276

Consecutive Decades

35 x 45

1. First two digits = the small ten's digit times one more than the large ten's digit.
2. Last two digits are always 75

3(4+1) 75

=15 75

Ending in 5…Ten's Digits Both Even

45 x 85

1. First two digits = the product of the ten's digits plus ½ the sum of the ten's digits.
2. Last two digits are always 25

4(8) + ½ (4+8) 25

=38 25

Ending in 5…Ten's Digits Both Odd

35 x 75

1. First two digits = the product of the ten's digits plus ½ the sum of the ten's digits.
2. Last two digits are always 25

3(7) + ½ (3+7) 25

=26 25

Ending in 5…Ten's Digits Odd&Even

35 x 85

1. First two digits = the product of the ten's digits plus ½ the sum of the ten's digits. Always drop the remainder.
2. Last two digits are always 75

3(8) + ½ (3+8) 75

=29 25

Squaring Numbers Ending In 5

75^2

1. First two digits = the ten's digit times one more than the ten's digit.
2. Last two digits are always 25

$$\underline{7(7+1)}\ \ \underline{25}$$

$$=\underline{56}\ \underline{25}$$

(1/8 rule)

Multiplying By 12 ½

32 x 12 ½

1. Divide the non-12 ½ number by 8.
2. Add two zeroes.

$$\frac{32}{8} = 4+00$$

$$= \underline{4}\ \underline{00}$$

(1/6 rule)

Multiplying By 16 2/3

42 x 16 2/3

1. Divide the non-16 2/3 number by 6.
2. Add two zeroes.

$$\frac{42}{6} = 7+00$$

$$= \underline{7}\ \underline{00}$$

(1/3 rule)

Multiplying By 33 1/3

24 x 33 1/3

1. Divide the non-33 1/3 number by 3.
2. Add two zeroes.

$$\frac{24}{3} = 8+00$$

$$= \underline{8}\ \underline{00}$$

(1/4 rule)

Multiplying By 25

32 x 25

1. Divide the non-25 number by 4.
2. Add two zeroes.

$$\frac{32}{4} = 8+00$$

$$= \underline{8}\ \underline{00}$$

(1/2 rule)

Multiplying By 50

32 x 50

1. Divide the non-50 number by 2.
2. Add two zeroes.

$$\frac{32}{2} = 16+00$$

$$= \underline{16}\ \underline{00}$$

(3/4 rule)

Multiplying By 75

32 x 75

1. Divide the non-75 number by 4.
2. Multiply by 3.
3. Add two zeroes.

$$\frac{32}{4} = 8x3=24+00$$

$$=\underline{24}\ \underline{00}$$

(1/8 rule)

Multiplying By 125

32 x 125

1. Divide the non-125 number by 8.
2. Add three zeroes.

$$\frac{32}{8} = 4+000$$

$$= 4\ 000$$

Multiplying When Tens Digits Are Equal And The Unit Digits Add To 10

32 x 38

1. First two digits are the tens digit times one more than the tens digit
2. Last two digits are the product of the units digits.

$$\underline{3(3+1)} \quad \underline{2(8)}$$

$$= \underline{12}\ \underline{16}$$

Multiplying When Tens Digits Add To 10 And The Units Digits Are Equal

67 x 47

1. First two digits are the product of the tens digit plus the units digit
2. Last two digits are the product of the units digits.

$$\underline{6(4)+7} \quad \underline{7(7)}$$

$$=\underline{31}\ \underline{49}$$

Multiplying Two Numbers in the 90's

97 x 94

1. Find out how far each number is from 100
2. The 1st two numbers equal the sum of the differences subtracted from 100
3. The last two numbers equal the product of the differences

100-(3+6) 3(6)

=91 18

Multiplying Two Numbers Near 100

109 x 106

1. First Number is always 1
2. The middle two numbers = the sum on the units digits
3. The last two digits = the product of the units digits

1 9+6 9(6)

= 1 15 54

Multiplying Two Numbers With 1st Numbers = And A 0 In The Middle

402 x 405

1. The 1st two numbers = the product of the hundreds digits
2. The middle two numbers = the sum of the units x the hundreds digit
3. The last two digits = the product of the units digits

4(4) 4(2+5) 2(5)

= 16 28 10

10101 Rule

Multiplying By 3367

18 x 3367

1. Divide the non-3367 # by 3
2. Multiply by 10101

18/3 = 6 x 10101=

= 60606

121 Pattern

Multiplying A 2-Digit # By 11

92 x 11

(ALWAYS WORK FROM RIGHT TO LEFT)

1. Last digit is the units digit
2. The middle digit is the sum of the tens and the units digits
3. The first digit is the tens digit + any carry

$$\underline{9+1}\ \underline{9+2}\ \underline{2}$$

$$= \underline{10}\ \underline{1}\ \underline{2}$$

1221 Pattern

Multiplying A 3-Digit # By 11

192 x 11

(ALWAYS WORK FROM RIGHT TO LEFT)

1. Last digit is the units digit
2. The next digit is the sum of the tens and the units digits
3. The next digit is the sum of the tens and the hundreds digit + carry
4. The first digit is the hundreds digit + any carry

1+1 1+9+1 9+2 2

=2 1 1 2

12321 Pattern

Multiplying A 3-Digit # By 111

192 x 111

(ALWAYS WORK FROM RIGHT TO LEFT)

1. Last digit is the units digit
2. The next digit is the sum of the tens and the units digits
3. The next digit is the sum of the units, tens and the hundreds digit + carry
4. The next digit is the sum of the tens and hundreds digits + carry
5. The next digit is the hundreds digit + carry

1+1 1+9+1 1+9+2+1 9+2 2

= 2 1 3 1 2

1221 Pattern

Multiplying A 2-Digit # By 111

41 x 111

(ALWAYS WORK FROM RIGHT TO LEFT)

1. Last digit is the units digit
2. The next digit is the sum of the tens and the units digits
3. The next digit is the sum of the tens and the units digits + carry
4. The next digit is the tens digit + carry

$$\underline{4}\ \underline{4+1}\ \underline{4+1}\ \underline{1}$$

$$= \underline{4}\ \underline{5}\ \underline{5}\ \underline{1}$$

Multiplying A 2-Digit # By 101

93 x 101

1. The first two digits are the 2-digit number x1
2. The last two digits are the 2-digit number x1

93(1) 93(1)

= 93 93

Multiplying A 3-Digit # By 101

934 x 101

1. The last two digits are the last two digits of the 3-digit number
2. The first three numbers are the 3-digit number plus the hundreds digit

934+9 34

= 943 34

Multiplying A 2-Digit # By 1001

87 x 1001

1. The first 2 digits are the 2-digit number x 1
2. The middle digit is always 0
3. The last two digits are the 2-digit number x 1

87(1) 0 87(1)

= 87 0 87

Halving And Doubling

52 x 13

1. Take half of one number
2. Double the other number
3. Multiply together

52/2 13(2)

= 26(26)= 676

One Number in the Hundreds And One Number In The 90's

95 x 108

1. Find how far each number is from 100
2. The last two numbers are the product of the differences subtracted from 100
3. The first numbers = the small number difference from 100 increased by 1 and subtracted from the larger number

108-(5+8+1) 100-(5x8)

= 94 60

Fraction Foil (Type 1)

$8\frac{1}{2} \times 6\frac{1}{4}$

1. Multiply the fractions together
2. Multiply the outside two number
3. Multiply the inside two numbers
4. Add the results and then add to the product of the whole numbers

(8)(6)+1/2(6)+1/4(8) (1/2x1/4)

= 53 1/8

Fraction Foil (Type 2)

$7\frac{1}{2} \times 5\frac{1}{2}$

1. Multiply the fractions together
2. Add the whole numbers and divide by the denominator
3. Multiply the whole numbers and add to previous step

(7x5)+6 (1/2x1/2)

= 41 1/4

Fraction Foil (Type 3)

$7\frac{1}{4} \times 7\frac{3}{4}$

1. Multiply the fractions together
2. Multiply the whole number by one more than the whole number

$$\underline{(7)(7+1)} \quad \underline{(1/4 \times 3/4)}$$

$$= \underline{56}\ \underline{3/16}$$

Adding Reciprocals

7/8 + 8/7

1. Keep the denominator
2. The numerator is the difference of the two numbers squared
3. The whole number is always two plus any carry from the fraction.

$$2\ \frac{(8-7)^2}{7\times 8}$$

$$=2\ \frac{1}{56}$$

Percent Missing the Of

36 is 9% of __

1. Divide the first number by the percent number
2. Add 2 zeros or move the decimal two places to the right

36/9 00

= 400

Base N to Base 10 Of

$42_6 = \_\_\_\_\_ 10$

1. Multiply the left digit times the base
2. Add the number in the units column

$$\underline{4(6)+2}$$

$$= \underline{26}_{10}$$

Multiplying in Bases

$$4 \times 53_6 = \_\_\_\__6$$

1. Multiply the units digit by the multiplier
2. If number cannot be written in base n subtract base n until the digit can be written
3. Continue until you have the answer

= 4x3=12 subtract 12 Write 0

= 4x5=20+2=22 subtract 18 Write 4

= Write 3

$$= 340_6$$

N/40 to a % or Decimal

21/40 ____ decimal

1. Mentally take off the zero
2. Divide the numerator by the denominator and write down the digit
3. Put the remainder over the 4 and write the decimal without the decimal point
4. Put the decimal point in front of the numbers

$$.\ \underset{21/4}{5}\ \ \underset{1/4}{25}$$

Remainder When Dividing By 9

867/9=____remainder

1. Add the digits until you get a single digit
2. Write the remainder

8+6+7=21=2+1=3

= 3

421 Method

Base 8 to Base 2

$$732_8 = \_\_\_\_\_{}_2$$

1. Mentally put 421 over each number
2. Figure out how each base number can be written with a 4, 2 and 1
3. Write the three digit number down

421	421	421
7	3	2
111	011	010

421 Method

Base 2 to Base 8 Of

$11011010_2 = \_\_\_\__8$

1. Separate the number into groups of 3 from the right.
2. Mentally put 421 over each group
3. Add the digits together and write the sum

421	421	421
111	011	010
7	3	2

Cubic Feet to Cubic Yards

$3ft \times 6ft \times 12ft = \_\_yds^3$

1. Try to eliminate three 3s by division
2. Multiply out the remaining numbers
3. Place them over any remaining 3s

$$\frac{3}{3} \quad \frac{6}{3} \quad \frac{12}{3}$$

$$1 \times 2 \times 4 = 4$$ Cubic yards

Cubic Feet to Cubic Yards

44 ft/sec ___ mph

1. Use 15 mph = 22 ft/sec
2. Find the correct multiple
3. Multiply the other number

22x2=44

15x2=30 mph

Cubic yards

Subset Problems

{F,R,O,N,T}=_____
SUBSETS

1. **Subsets=2^n**
2. **Improper subsets always = 1**
3. **Proper subsets = $2^n - 1$**
4. **Power sets = subsets**

$2^5=32$ subsets

Repeating Decimals to Fractions

$.\overline{18} =$ _____ fraction

1. The numerator is the number
2. Read the number backwards. If a number has a line over it then there is a 9 in the denominator
3. Write the fraction and reduce

$$\frac{18}{99} = \frac{2}{11}$$

Repeating Decimals to Fractions

$.1\overline{8} = \_\_\_\_\_$ fraction

1. The numerator is the number minus the part that does not repeat
2. For the denominator read the number backwards. If it has a line over it, it is a 9. if not it is a o.

$$\frac{18-1}{90} = \frac{17}{90}$$

Gallons ⬌ Cubic Inches

2 gallons= ___ in^3

(Factors of 231 are 3, 7, 11)

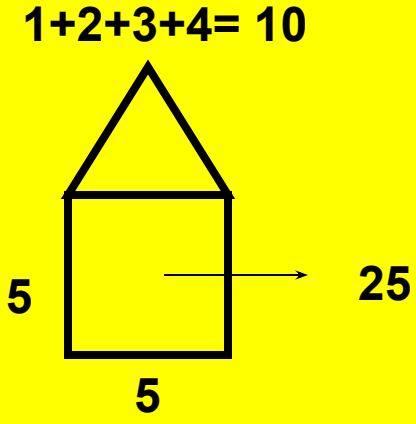
1. **Use the fact: 1 gal= 231 in^3**
2. **Find the multiple or the factor and adjust the other number. (This is a direct variation)**

$\underline{2(231)= 462\ in^3}$

Finding Pentagonal Numbers

5^{th} Pentagonal # = ___

1. Use the house method)
2. Find the square #, find the triangular #, then add them together



25+10=35

Finding Triangular Numbers

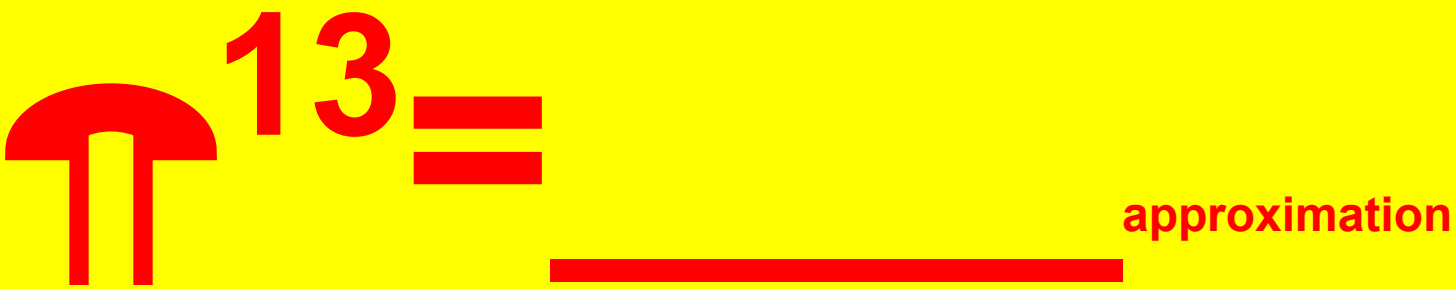
6^{th} Triangular # = ___

1. Use the n(n+1)/2 method
2. Take the number of the term that you are looking for and multiply it by one more than that term.
3. Divide by 2 (Divide before multiplying)

6(6+1)=42

42/2=21

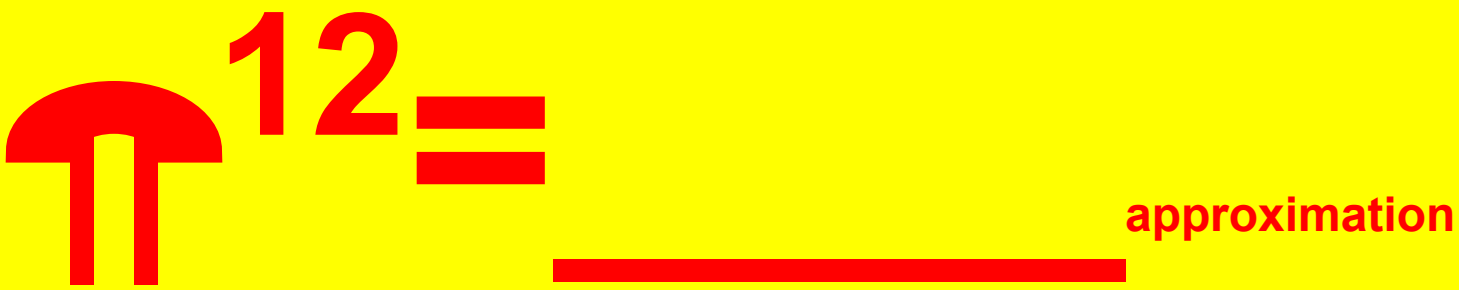
Pi To An Odd Power



1. Pi to the 1st = 3 (approx) Write a 3
2. Add a zero for each odd power of Pi after the first

3000000

Pi To An Even Power



1. Pi to the 2nd = 95 (approx) Write a 95
2. Add a zero for each even power of Pi after the 4th

950000

The More Problem

17/15 x 17

1. The answer has to be more than the whole number.
2. The denominator remains the same.
3. The numerator is the difference in the two numbers squared.
4. The whole number is the original whole number plus the difference

$$\frac{17+2}{} \quad \frac{(17-15)^2}{15}$$

$$= 19 \ \frac{4}{15}$$

The Less Problem

15/17 x 15

1. The answer has to be less than the whole number.
2. The denominator remains the same.
3. The numerator is the difference in the two numbers squared.
4. The whole number is the original whole number minus the difference

$$15-\frac{(17-15)^2}{17}$$

$$=13\ \frac{4}{17}$$

Multiplying Two Numbers Near 1000

994 x 998

1. Find out how far each number is from 1000
2. The 1st two numbers equal the sum of the differences subtracted from 1000
3. The last two numbers equal the product of the differences written as a 3-digit number

1000-(6+2) 6(2)

=992 012

Two Things Helping

The (Reciprocal) Work Problem

1/6 + 1/5 = 1/X

1. Use the formula (ab)/(a+b).
2. The numerator is the product of the two numbers.
3. The denominator is the sum of the two numbers.
4. Reduce if necessary

$$30=\underline{6(5)}$$

$$11=6+5$$

$$=\underline{30/11}$$

Two Things working Against Each Other

The (Reciprocal) Work Problem

1/6 - 1/8 = 1/X

1. Use the formula (ab)/(a-b).
2. The numerator is the product of the two numbers.
3. The denominator is the difference of the two numbers from right to left.
4. Reduce if necessary

$$48=\underline{6(8)}$$

$$2=8-6$$

$$=\underline{24}$$

The Inverse Variation % Problem

30% of 12 = 20% of ___

1. Compare the similar terms as a reduced ratio
2. Multiple the other term by the reduced ratio.
3. Write the answer

30/20=3/2

3/2(12)=18

=18

Sum of Consecutive Integers

1+2+3+…..+20

1. Use formula n(n+1)/2
2. Divide even number by 2
3. Multiply by the other number

(20)(21)/2

10(21)= 210

Sum of Consecutive Even Integers

2+4+6+…..+20

1. Use formula n(n+2)/4
2. Divide the multiple of 4 by 4
3. Multiply by the other number

(20)(22)/4

5(22)= 110

Sum of Consecutive Odd Integers

1+3+5+…..+19

1. Use formula $((n+1)/2)^2$
2. Add the last number and the first number
3. Divide by 2
4. Square the result

$$(19+1)/2=$$

$$10^2 = 100$$

Finding Hexagonal Numbers

Find the 5th Hexagonal Number

1. Use formula $2n^2-2n$
2. Square the number and multiply by2
3. Subtract the number wanted from the previous answer

$$2(5)^2= 50$$

$$50-5=$$

$$45$$

Cube Properties

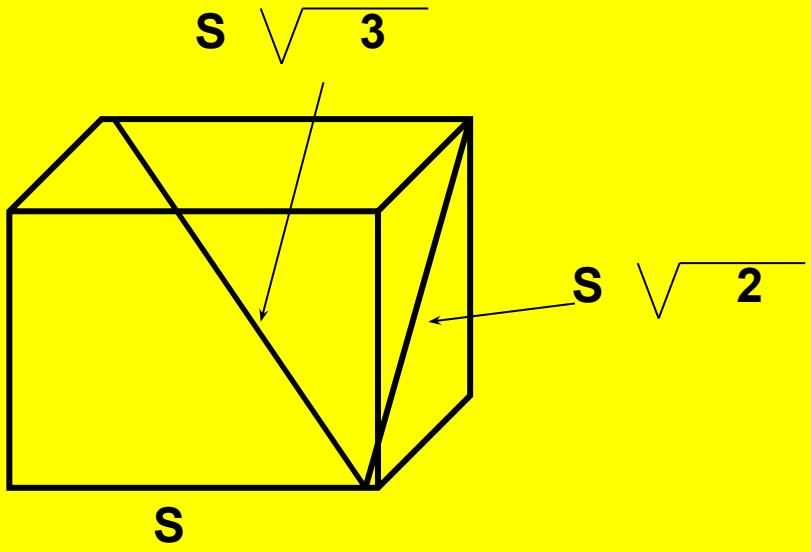
Find the Surface Area of a Cube Given the space Diagonal of 12

1. Use formula Area = $2D^2$
2. Simplify if needed.

$$2(12)(12)=288$$

Cube Properties

Find S, Then Use It To Find Volume or Surface Area



Finding Slope From An Equation

$3X+2Y=10$

1. Solve the equation for Y
2. The number in fron of X is the Slope

$$3X+2Y=10$$

$$Y = -\frac{3}{2}X + 5$$

$$\text{Slope} = -3/2$$

Hidden Pythagorean Theorem

Find The Distance Between These Points

(6,2) and (9,6)

1. Find the distance between the X's
2. Find the distance between the Y's
3. Look for a Pythagorean triple
4. If not there, use the Pythagorean Theorem

3	4	5
5	12	13
7	24	25
8	15	17

Common Pythagorean triples

9-6=3 **6-2=4**

3 **4** **5**

The distance is 5

Finding Diagonals

Find The Number Of Diagonals In An Octagon

1. Use the formula n(n-3)/2
2. N is the number of vertices in the polygon

8(8-3)/2=

20

Finding the total number of factors

24= _____

1. Put the number into prime factorization
2. Add 1 to each exponent
3. Multiply the numbers together

$3^1 \times 2^3 =$

1+1=2 3+1=4

2x4=8

Estimating a 4-digit square root

$\sqrt{7549} =$ _____

1. The answer is between 80^2 and 90^2
2. Find 85^2
3. The answer is between 85 and 90
4. Guess any number in that range

$80^2 = 6400$

$85^2 = 7225 \longrightarrow 87$

$90^2 = 8100$

Estimating a 5-digit square root

$\sqrt{37485} =$ _____

1. Use only the first three numbers
2. Find perfect squares on either side
3. Add a zero to each number
4. Guess any number in that range

$19^2=361$

$20^2=400$

190-200 ⟶ 195

C F

55C = _____ F

1. Use the formula F= 9/5 C + 32
2. Plug in the C number
3. Solve for the answer

$$9/5(55) + 32$$

$$99+32$$

$$= 131$$

C ◆ F

50F = _____ C

1. Use the formula C = 5/9 (F-32)
2. Plug in the F number
3. Solve for the answer

5/9(50-32)

5/9(18)

= 10

2-Digit Number Times 1001

87 x 1001

1. 87 times 1
2. Put a zero in the middle
3. 87 x 1

87 0 87

87087

Finding The Product of the Roots

$$4X^2 + 5X + 6$$

a b c

1. Use the formula c/a
2. Substitute in the coefficients
3. Find answer

$$6 / 4 = 3/2$$

Finding The Sum of the Roots

$$4X^2+5X+6=0$$

a b c

1. Use the formula -b/a
2. Substitute in the coefficients
3. Find answer

-5 / 4

Estimation
999999 Rule

142857 x 26 =

1. Divide 26 by 7 to get the first digit
2. Take the remainder and add a zero
3. Divide by 7 again to get the next number
4. Find the number in 142857 and copy in a circle

26/7 =3r5

5+0=50/7=7

3 714285

Area of a Square Given the Diagonal

Find the area of a square with a diagonal of 12

1. Use the formula Area = ½ D_1D_2
2. Since both diagonals are equal
3. Area = ½ x12 x 12
4. Find answer

$$\frac{1}{2} D_1 D_2$$

$$\frac{1}{2} \times 12 \times 12$$

$$72$$

Estimation of a 3 x 3 Multiplication

346 x 291 =

1. Take off the last digit for each number
2. Use LIOF
3. Add two zeroes
4. Write answer

34 x 29

986 + 00

98600

Adding Reciprocals

$$\frac{7}{8} + \frac{8}{7}$$

1. Work backwards
2. The fraction is the difference of the two numbers squared then put over the product of the numbers
3. Write the fraction
4. The whole number is always 2 plus any carry

$$8-7=1 \qquad 1^2=1$$

$$2\ \ 1/56$$

Dividing by 11 and finding the remainder

7258 / 11= _____

Remainder

1. Start with the units digit and add up every other number
2. Do the same with the other numbers
3. Subtract the two numbers
4. If the answer is a negative or a number greater than 11 add or subtract 11 until you get a number from 0-10

8+2=10 **7+5= 12**

10-12= -2 +11= 9

Multiply By Rounding

2994 x 6 =

1. Round 2994 up to 3000
2. Think 3000 x 6
3. Write 179. then find the last two numbers by multiplying what you added by 6 and subtracting it from 100.

3000(6)=179

6(6)=36 100-36=64

=17964

The Sum of Squares
(factor of 2)

$$12^2 + 24^2 =$$

1. Since 12 goes into 24 twice…
2. Square 12 and multiply by 5

$$12^2 = 144$$

$$144 \times 5 =$$

$$= 720$$

The Sum of Squares
(factor of 3)

$$12^2 + 36^2 =$$

1. Since 12 goes into 24 three times…
2. Square 12 and multiply by 10

$$12^2 = 144$$
$$144 \times 10 =$$
$$= 1440$$

The Difference of Squares

(Sum x the Difference)

$$32^2 - 30^2 =$$

1. Find the sum of the bases
2. Find the difference of the bases
3. Multiply them together

$$32+30=62$$
$$32-30=2$$
$$62 \times 2 = 124$$

Addition by Rounding
(Sum using the Difference)

2989 + 456=

1. Round 2989 to 3000
2. Subtract the same amount to 456, 456-11= 445
3. Add them together

2989+11= 3000
456-11=445
3000+445=3445

123…x9 + A Constant one more than length

(1111…Problem)

123 x 9 + 4

1. The answer should be all 1s. There should be 1 more 1 than the length of the 123… pattern.
2. You must check the last number to see if it is a trick number not following the pattern.

$$3x9 + 4 = 31$$

$$1111$$

Supplement and Complement

Find The Difference Of The Supplement And The Complement Of An Angle Of 40.

1. The answer is always 90

=90

Supplement and Complement

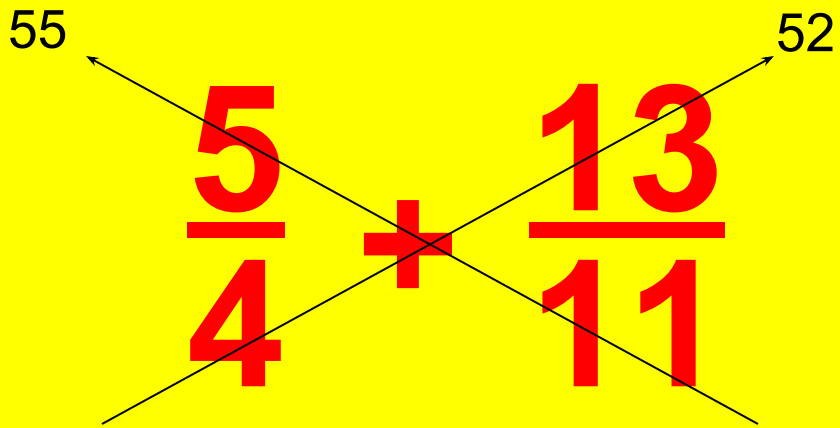
Find The Sum Of The Supplement And The Complement Of An Angle Of 40.

1. Use the formula 270-twice the angle
2. Multiple the angle by 2
3. Subtract from 270

270-80=

=190

Larger or Smaller



1. Find the cross products
2. The larger fraction is below the larger number
3. The smaller number is below the smaller number

Larger = 5/4

Smaller = 13/11

Two Step Equations
(Christmas Present Problem)

$$\frac{A}{3} - 1 = 11$$

1. Start with the answer and undo the operations using reverse order of operations

11+1=12

12 x3 = 36

Relatively Prime
(No common Factors Problem)
*** One is relatively prime to all numbers**

How Many #s less than 20 are relatively prime to 20?

1. Put the number into prime factorization
2. Subtract 1 from each exponent and multiply out all parts separately
3. Subtract 1 from each base
4. Multiply all parts together

$$2^2 \times 5^1 = 2^1 \times 5^0 = 2 \times 1$$

$$2 \times 1 \times 1 \times 4 = 8$$

Product of LCM and GCF

Find the Product of the GCF and the LCM of 6 and 15

1. Multiple the two numbers together

$$6 \times 15 = 90$$

Estimation

15 x 17 x 19

1. Take the number in the middle and cube it

$$17^3=4913$$

Sequences-Finding the Pattern

7, 2, 5, 8, 3, 14

Find the next number in this pattern

1. **If the pattern is not obvious try looking at every other number. There may be two patterns put together**

7, 2, 5, 8, 3, 14

1

Sequences-Finding the Pattern

1, 4, 5, 9, 14, 23

Find the next number in this pattern

1. If nothing else works look for a Fibonacci Sequence where the next term is the sum of the previous two

1, 4, 5, 9, 14, 23

14+23=37

Degrees ⟷ Radians

$$90^0 = \frac{\quad}{\text{Radians}}$$

1. If you want radians use Pi X/180
2. If you want degrees use 180 x/Pi

$$90(Pi)/180$$

$$=Pi/2$$

A. Area of a square, given the side: $A = s^2$

B. Area of a square, given the diagonal: $A = \frac{d^2}{2}$

C. Area of a rhombus, given diagonals: $A = \frac{d_1 \times d_2}{2}$

(B and C are closely related. How?)

D. Area of a triangle: $A = \frac{bh}{2}$

E. Area of a circle: $A = \pi r^2$

F. Area of a trapezoid: $A = \frac{1}{2}h(b_1 + b_2)$