Lesson 1-3
Square and Square Roots

<u>Square</u>:

Symbol:

Ex.1 Find the square of 10.

Ex. 2 What is the square of 15?

FILL in the table

1^2	2^2	3^2	4^2	5^2	6^2	7^2	8^2	9^2	10^2

11^2	12^2	13^2	14^2	15^2	16^2	17^2	18^2	19^2	20^2

<u>Square root</u>:

Symbol:

Ex. 3 $\sqrt{36}$

Ex. 4 $\sqrt{289}$

FILL in the table

$\sqrt{1}$	$\sqrt{4}$	$\sqrt{9}$	$\sqrt{16}$	$\sqrt{25}$	$\sqrt{36}$	$\sqrt{49}$	$\sqrt{64}$	$\sqrt{81}$	$\sqrt{100}$

$\sqrt{121}$	$\sqrt{144}$	$\sqrt{169}$	$\sqrt{196}$	$\sqrt{225}$	$\sqrt{256}$	$\sqrt{289}$	$\sqrt{324}$	$\sqrt{361}$	$\sqrt{400}$

Lesson 1-4
<u>Order of operations</u>

** The 4 basic Operations of Math are:

1.   2.   3.   4.

$$\boxed{\text{ORDER OF OPERATIONS}}$$

P→

E→

M or D → $\boxed{\text{EX:1}}$ $12 \div 3 \cdot 2$
(left to right)

A or S → $\boxed{\text{EX:2}}$ $20 - 10 + 4$
(left to right)

$\boxed{\text{Ex: 3}}$
$32 \div 4 + 3 * 10$ $\boxed{\text{Ex: 4}}$
                                       $2^5 + 7(9 - 1)$

$\boxed{\text{Ex: 5}}$
$(24 + 8) \div 4 + 4$

                                       $\boxed{\text{Ex: 6}}$
                                       $(4 + 2) * (7 + 4)$

$\boxed{\text{Ex: 7}}$
$27 \div 3 * 2 + 4^2$ $\boxed{\text{Ex: 8}}$
                                       $8 * 3 - (9 - 6)^2$

Lesson 1-3
Square and Square Roots

(#=number)

Square: to multiply a # by itself
(# gets bigger)

| Symbol: | x^2 |

Ex.1 Find the square of 10. $10^2 = 10 \cdot 10 = \boxed{100}$

Ex. 2 What is the square of 15? $15^2 = 15 \cdot 15 = \boxed{225}$

FILL in the table

1^2	2^2	3^2	4^2	5^2	6^2	7^2	8^2	9^2	10^2
1	4	9	16	25	36	49	64	81	100

11^2	12^2	13^2	14^2	15^2	16^2	17^2	18^2	19^2	20^2	25^2	30^2
121	144	169	196	225	256	289	324	361	400	625	900

* undo a square

Square root: The factors multiplied to form a perfect square
(radical)

(# gets smaller)

| Symbol: | $\sqrt{x}$ |

Ex. 3 $\sqrt{36} = \boxed{6}$
          ∧
         6 6

Ex. 4 $\sqrt{289} = \boxed{17}$
           ∧
         17 17

Area

16 in²

Side length
$\sqrt{16} = \boxed{4 \text{ in}}$

FILL in the table

$\sqrt{1}$	$\sqrt{4}$	$\sqrt{9}$	$\sqrt{16}$	$\sqrt{25}$	$\sqrt{36}$	$\sqrt{49}$	$\sqrt{64}$	$\sqrt{81}$	$\sqrt{100}$
1	2	3	4	5	6	7	8	9	10

$\sqrt{121}$	$\sqrt{144}$	$\sqrt{169}$	$\sqrt{196}$	$\sqrt{225}$	$\sqrt{256}$	$\sqrt{289}$	$\sqrt{324}$	$\sqrt{361}$	$\sqrt{400}$
11	12	13	14	15	16	17	18	19	20
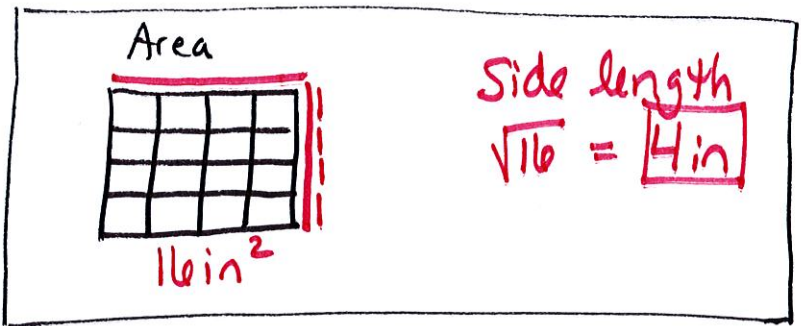
Bonus: $\sqrt{5^2} = \boxed{5}$

Lesson 1-4
Order of operations

** The 4 basic Operations of Math are:
1. + Add
2. − subt
3. • multiply
4. ÷ Divide

Order of operations

( ) — there has to be an operation in there

① P→ parentheses

② E→ Exponents

③ M or D → multiply & Divide
(left to right)

$12 \div 3 \cdot 2$
$4 \cdot 2 = ⑧$

④ A or S → Add or Subtract
(left to right)

$20 - 10 + 4$
$10 + 4$ ⑭

Do whatever comes first when reading the problem left to Right

Ex. 1
$32 \div 4 + 3 * 10$

Ex. 2
$(24 + 8) \div 4 + 4$
$32 \div 4 + 4$
$8 + 4$
$\boxed{12}$

Ex. 3
$27 \div 3 * 2 + 4^2$

Ex. 4
$2^5 + 7(9 - 1)$
$2^5 + 7(8)$
$32 + 7(8)$
$32 + 56$ $\boxed{88}$

(means 7 times 8)

$2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$
$4 \cdot 2 \cdot 2 \cdot 2$
$8 \cdot 2 \cdot 2$
$16 \cdot 2$
32

Ex. 5
$(4 + 2) * (7 + 4)$

Ex. 6
$2 * 3 - (9 - 6)^2$
$2 \cdot 3 - (3)^2$
$2 \cdot 3 - 9$
$6 - 9$
$\boxed{-3}$

$3 \cdot 3$

Lesson 1-2 "Powers and Exponents" (p 30-31)

Main idea: Use Powers & Exponents

Base:
the number being multiplied

ex: 2^4

Exponent:
tells me the number of times the base is multiplied by itself

ex: $2^4 = 2 \cdot 2 \cdot 2 \cdot 2$

Powers:
numbers expressed using exponents

ex: $2^4, 5^9, 4^6, 7^7$

Squared:
to the second power

ex: $5^2, 7^2, 2^2, 9^2$

Cubed:
to the third power

ex: $3^3, 10^3, 9^3$

Factors:
two or more numbers multiplied together to form an answer

(product)

Date: _____

Evaluate: to find the value of
(work it out to get a final answer)

Directions: Evaluate the expression
(ex 1) $2^5 = 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 = \boxed{32}$
(ex 2) $7^2 = 7 \cdot 7 = \boxed{49}$

Standard Form: numbers written without exponents

* We evaluated 2^5 and put the answer in standard form to get 32 ☺

Exponential Form: numbers written with exponents

Directions: Write in exponential form
(ex 1) $3 \cdot 3 \cdot 3 \cdot 3 = 3^4$
(ex 2) $4 \cdot 4 \cdot 4 = 4^3$

Directions: Write each power as a product of the same factor.
(ex 1) $7^5 = \boxed{7 \cdot 7 \cdot 7 \cdot 7 \cdot 7}$
(ex 2) $1^3 = \boxed{1 \cdot 1 \cdot 1}$

9/7/10 Squares and Square Roots (pg 34-37)

Symbol
$7^{②}$

Square: to the second power
(to multiply the number by itself)
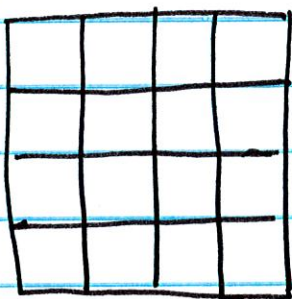
$$7^2 = 7 \times 7 = 49$$

3 [grid square] 3
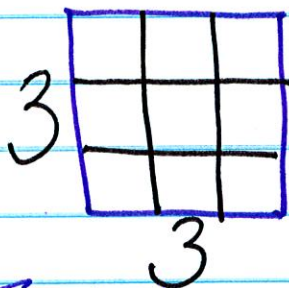
$$3^2 = 3 \times 3 = 9$$

ex1: Find the square of 10. $10^2 = 10 \times 10 = 100$

ex2: What is the square of 15? $15^2 = 15 \times 15 = 225$

Symbol
$\sqrt{}$

Square Root: the factors multiplied to form a perfect square

$$\sqrt{16} = 4 \text{ because } 4 \times 4 = 16$$

$$\begin{array}{r} 16 \\ \times 16 \\ \hline 96 \\ 160 \\ \hline 256 \end{array} \qquad \begin{array}{r} 17 \\ \times 17 \\ \hline 119 \\ 170 \\ \hline 289 \end{array}$$

ex3: $\sqrt{36} = 6$

ex4: $\sqrt{289} = 17$ ....$^{?}$

$10 \times 10 = 100$
$15 \times 15 = 225$
289
$20 \times 20 = 400$

9/9/10 Order of Operations (p 38-41)

The 4 Basic Operations of Math

1) Add
2) Subtract
3) Multiply
4) Divide

* Mathematicians agreed on an <u>ORDER</u> for the operations so that every problem only has <u>one</u> true answer.

P → Parantheses ( ) There has to be an operation INSIDE (⌣)

E → Exponents

M or D → Multiply or Divide

Do whatever comes first when reading the problem from left to right

ex 1: $12 \div 3 \times 2$

4×2

8

A or S → Add or Subtract

ex 2: $20 - 10 + 4$

$10 + 4$

14

ex 3: $32 \div 4 + 3 \times 10$

$8 \quad\quad + 3 \times 10$

$8 \quad + \quad 30$

38

ex 4: $(24 + 8) \div 4 + 4$

$32 \quad \div 4 + 4$

$8 \quad + \quad 4$

12

ex 5: $27 \div 3 \times 2 + 4^2$

4×4

$27 \div 3 \times 2 + 16$

$9 \quad \times 2 \quad + 16$

$18 \quad + \quad 16$

34

ex5: $27 \div 3 \times 2 + 4^2$

$27 \div 3 \times 2 + 16$

$9 \times 2 + 16$

$18 + 16$

34

ex6: $2^5 + 7(9-1)$

$2^5 + 7(8)$

$32 + 7(8)$

$32 + 56$

88

ex 7: $(4+2) \cdot (7+4)$

$6 \cdot (7+4)$

$6 \cdot 11$

66