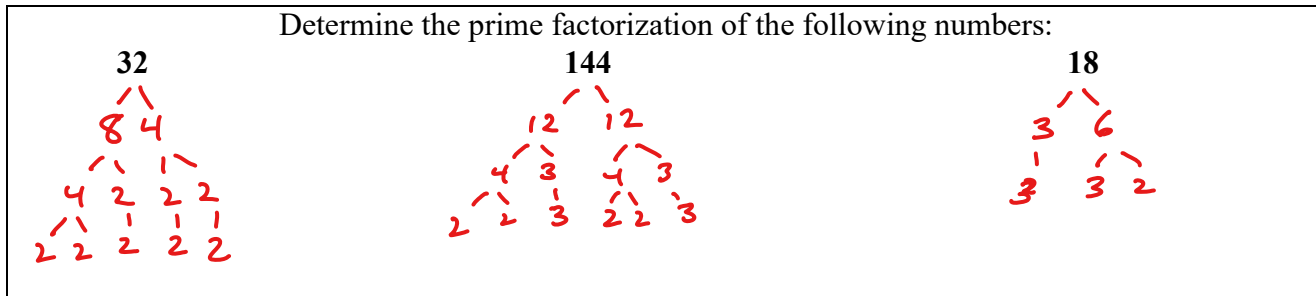


Date: \_\_\_\_\_

**KEY**

### 3.1 Squares and Square Roots

Determine the prime factorization of the following numbers:



$2^5$

$2^4 \cdot 3^2$

$2 \cdot 3^2$

The square of a number is a number multiplied by itself  
 $3 \times 3 = 9$

A Prime number is: a number with only two factors: one and itself

$3^2 = 9$  \* The square of a whole number is a: perfect square

A perfect square is:  
the square of a whole number

List the first 10 perfect squares:

- 1
- 4
- 9
- 16
- 25
- 36
- 49
- 64
- 81
- 100

Julia knows that her square ipod has a side length of 4 cm. What is the area of the ipod?

Solution:

Method 1:

$$A = S^2$$

$$= (4)^2$$

$$= 16$$

Method 2:

DRAW:

16 square units

$$A = 16$$

A Square Root is: *the number which, when multiplied by itself, produces a number*

Find the square root of the following numbers:

$$\sqrt{64} = 8$$

$$\sqrt{49} = 7$$

$$\sqrt{81} = 9$$

How does squaring a number relate to taking the square root of number?

*They are inverse operations.*

$$6^2 = 36 \quad \sqrt[2]{36} = 6$$

### Example 1

Raj has a square ipod nano with an area of  $36 \text{ cm}^2$ . What is the length of each side?



$$x = \sqrt{36}$$

$$x = 6 \text{ cm}$$

### Example 2

The evil math teacher Mr. Root told his grade 8 students to run twice around the perimeter of the school field (as they didn't finish their homework). The Area of the square field is  $2916 \text{ m}^2$ . What is the distance that the students had to run?



THINK!

① FIND  $x$

② CALCULATE THE DISTANCE AS  $8x$

$$\textcircled{1} \quad x = \sqrt{2916}$$

$$x = 54 \text{ m}$$

$$\textcircled{2} \quad d = 8x \\ = 8(54 \text{ m})$$

$$d = 432 \text{ m}$$