

5.4 Square Roots q'

$$\sqrt[3]{8} = 2$$

$$2^3 = 8$$

$$1^2 = 1$$

$$\sqrt{9'} = 3$$

$$2^2 = 4$$

$$9^{\frac{1}{2}} = 3$$

$$3^2 = 9$$

$$9 \wedge (1 \div 2)$$

$$3$$

$$4^2 = 16$$

$$5^2 = 25$$

$$6^2 = 36$$

$$7^2 = 49$$

$$\sqrt{49}$$

$$8^2 = 64$$

$$7$$

$$9^2 = 81$$

$$\sqrt{81}$$

$$10^2 = 100$$

$$9$$

$$11^2 = 121$$

$$12^2 = 144$$

$$13^2 = 169$$

$$14^2 = 196$$

$$15^2 = 225$$

$$20^2 = 400$$

$$25^2 = 625$$

$$\sqrt{24}$$

$$\approx 4.89$$

$$4^2 = 16$$

$$\approx 4.89^2 = 24$$

$$5^2 = 25$$

Simplest Radical Form

Factors of 24

$$\sqrt{24}$$

~~$$1 \cdot 24$$~~

$$\sqrt{4 \cdot 6}$$

$$2 \cdot 12$$

$$\sqrt{4} \cdot \sqrt{6}$$

$$3 \cdot 8$$

$$2\sqrt{6}$$

Perfect Squares

$$\sqrt{72} \approx 8.49$$

Factors

$$\sqrt{36 \cdot 2}$$

$$1 \cdot 72 \text{ largest}$$

$$\sqrt{36} \cdot \sqrt{2}$$

$$2 \cdot 36$$

Exact $6\sqrt{2}$

$$3 \cdot 24$$

$$4 \cdot 18$$

$$6 \cdot 12$$

$$8 \cdot 9$$

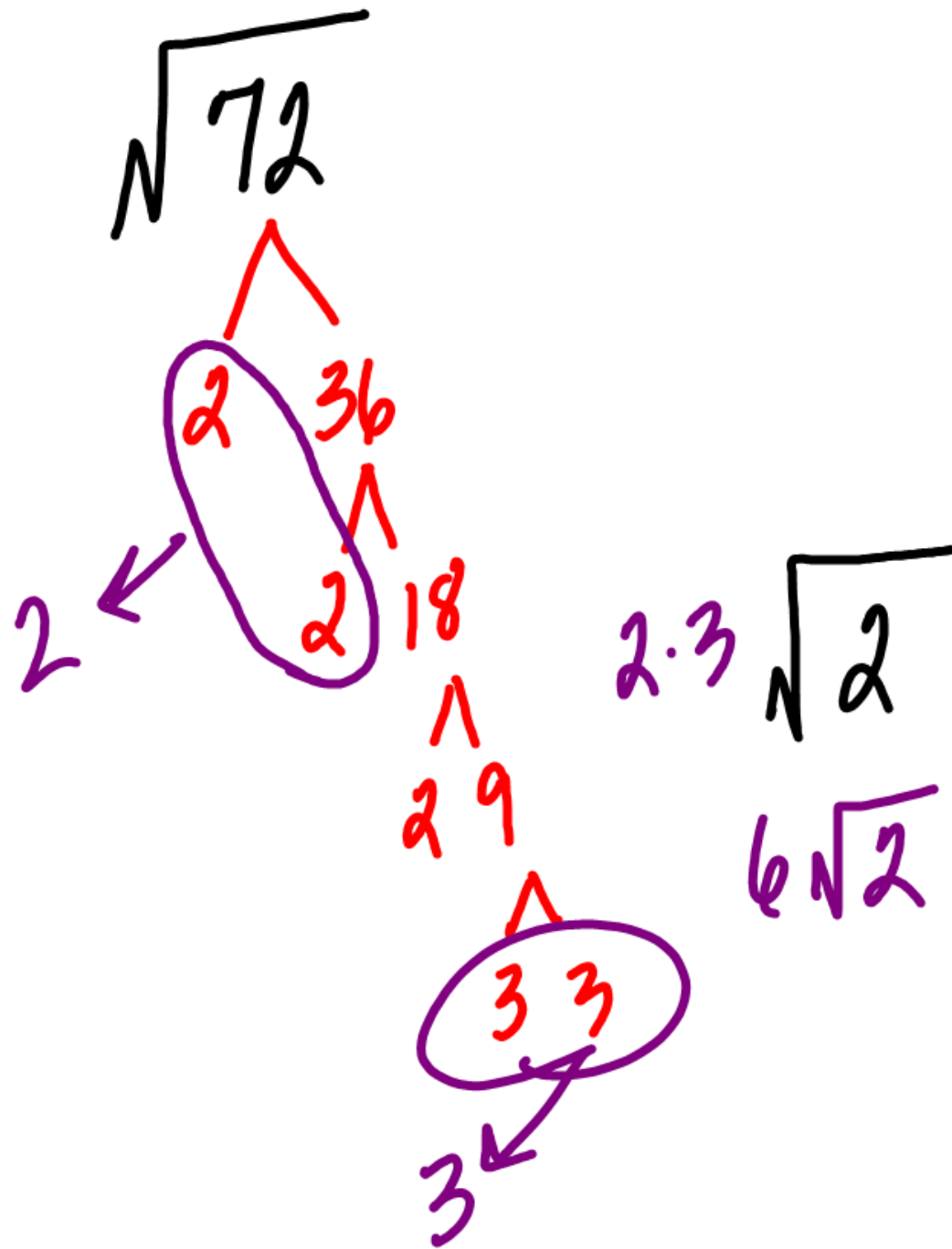
OR $\sqrt{9 \cdot 8}$

$$3\sqrt{8}$$

$$3\sqrt{4 \cdot 2}$$

$$3 \cdot 2\sqrt{2}$$

$$6\sqrt{2}$$



$$\sqrt{60}$$

$$\sqrt{4 \cdot 15}$$

$$\sqrt{4} \sqrt{15}$$

$$2\sqrt{15}$$

~~$$1 \cdot 60$$~~

$$2 \cdot 30$$

$$3 \cdot 20$$

$$4 \cdot 15$$

$$5 \cdot 12$$

$$6 \cdot 10$$

$$\sqrt{15}$$

~~$$+15$$~~

$$3 \cdot 5$$

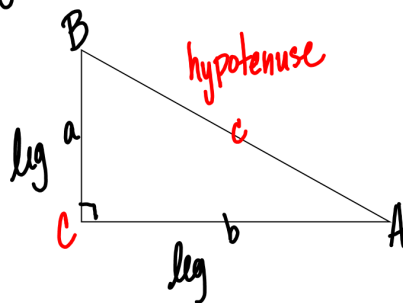
$$\sqrt{21}$$

$$3\sqrt{8}$$

$$3\sqrt{4 \cdot 2}$$

$$6\sqrt{2}$$

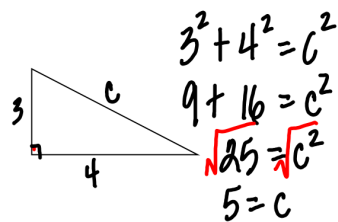
Right Triangle



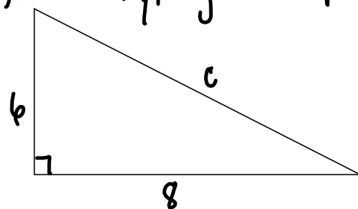
Pythagorean Theorem

$a^2 + b^2 = c^2$

a, b legs *c hypotenuse*

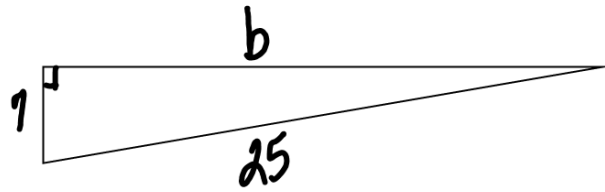


3, 4, 5 Pythagorean Triples



$6^2 + 8^2 = c^2$
 $36 + 64 = c^2$
 $\sqrt{100} = \sqrt{c^2}$
 $10 = c$

- 3, 4, 5
- 6, 8, 10
- 9, 12, 15
- 12, 16, 20



$$7^2 + b^2 = 25^2$$

$$49 + b^2 = 625$$

.49

- 49

$$\sqrt{b^2} = \sqrt{576} \quad 7, 24, 25$$

$$b = 24$$

$$a = 5$$

$$b = ?$$

$$c = 13$$

$$a^2 + b^2 = c^2$$

$$5^2 + b^2 = 13^2$$

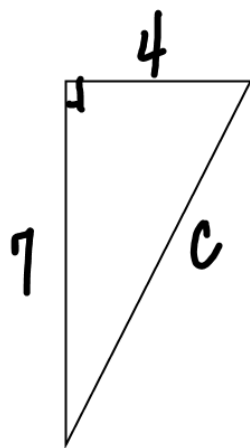
$$25 + b^2 = 169$$

-25

-25

$$\sqrt{b^2} = \sqrt{144}$$

$$b = 12$$



$$4^2 + 7^2 = c^2$$

$$16 + 49 = c^2$$

$$\sqrt{65} = \sqrt{c^2}$$

$$\text{Approx. } 8.06 \approx c$$

$$\text{Exact } \sqrt{65} = c$$

p 326

8-16 E