# Sec 8.3 (cont.)

## Simplified Radicals

1. the Radicand has NO factor raised to power greater than or equal to index
2. The Radicand has NO fractions
3. No denominator has Radicals
4. Exponents in Radicand and index have NO common factor other than 1.

## Simplify

$$\sqrt{25p^4} = \sqrt{25}\cdot\sqrt{p^4} = \boxed{5p^2}$$

$\sqrt{p^4} = \sqrt{p^2}\cdot\sqrt{p^2}$

$= p \cdot p$

$y^7 = y^3 \cdot y^3 \cdot y$

$$\sqrt[3]{-27y^7x^5z^6} = \sqrt[3]{-27}\ \sqrt[3]{y^7}\ \sqrt[3]{x^5}\ \sqrt[3]{z^6}$$

$$= -3y^2\sqrt[3]{y}\cdot x\sqrt[3]{x^2}\ z^2$$

$$= -3xy^2z^2\sqrt[3]{yx^2}$$

#58

$$-\sqrt[5]{2048}$$

$$-\left(2\cdot 2\sqrt[5]{2}\right)$$

$$-4\sqrt[5]{2}$$

$2048 = 2^{11}$

2 · 1024 · 2 · 512 · 2 · 256 · 2 · 128 · 2 · 64 · 2 · 32 · 2 · 16 · 2 · 8 · 2 · 4 · 2 · 2

#59 $\sqrt[6]{128}$

$2\sqrt[6]{2}$

128 = 2 · 64

64 = 8 · 8

8 = 2 · 4

4 = 2 · 2

#54 $-\sqrt[4]{1250}$

$-5\sqrt[4]{2}$

1250 = 10 · 125

10 = 2 · 5

125 = 5 · 25

25 = 5 · 5

#66 $\sqrt{169 s^5 t^{10}}$

$13 s^2 t^5 \sqrt{s}$

169 = 13 · 13

$(t\cdot t)(t\cdot t)(t\cdot t)(t\cdot t)(t\cdot t)$

divisible by 2
- even

divisible by 3
- add digits
total divisible by 3, then original # is

divisible by 5
- ends in 5 or 0

#99 $\sqrt[10]{x^{25}} = x^{\frac{25}{10}} = x^{5/2} = \sqrt{x^5} = x^2\sqrt{x}$

Goal is to Rewrite as Single Radical

$\sqrt{7} \cdot \sqrt[3]{2}$ ← I need index to be same

$7^{1/2}\ 2^{1/3}$ (·3 / ·3, ·2 / ·2)

$= 7^{3/6}\ 2^{2/6}$

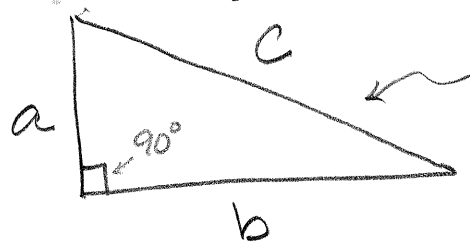
$= \sqrt[6]{7^3} \cdot \sqrt[6]{2^2}$

$= \sqrt[6]{7^3 2^2}$

$= \boxed{\sqrt[6]{1372}}$

# The Pythagorean Theorem

for

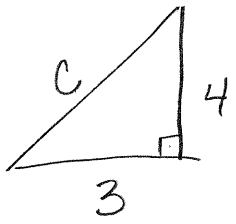



hypotenuse always the side across from the Right angle

Note: in a Right, always Longest side

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

For any Right triangle, the sum of the squares of the two legs is equal to the square of the hypotenuse.



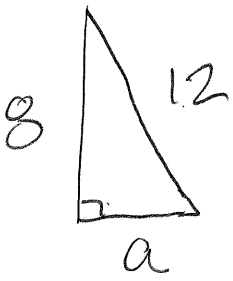

$$3^2 + 4^2 = c^2$$

$$9 + 16 = c^2$$

$$25 = c^2$$

$$c = \sqrt{25}$$

$$c = 5$$




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

$$a^2 + 8^2 = 12^2$$

$$a^2 + 64 = 144$$

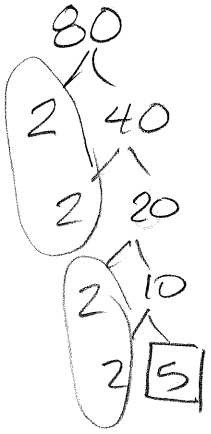
$$-64 \quad -64$$

$$a^2 = 80$$

$$a = \sqrt{80}$$

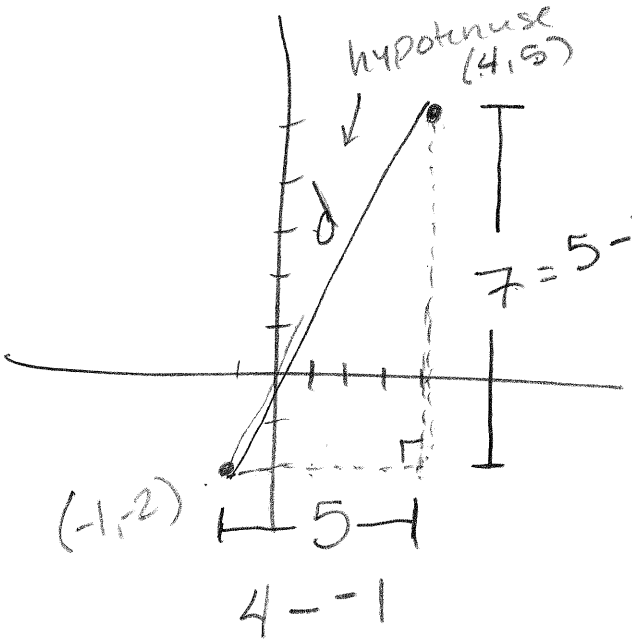
$$a = 2 \cdot 2\sqrt{5}$$

$$= \boxed{4\sqrt{5}}$$



two points in the coordinate system, asked to find distance between

$(4,5), (-1,-2)$



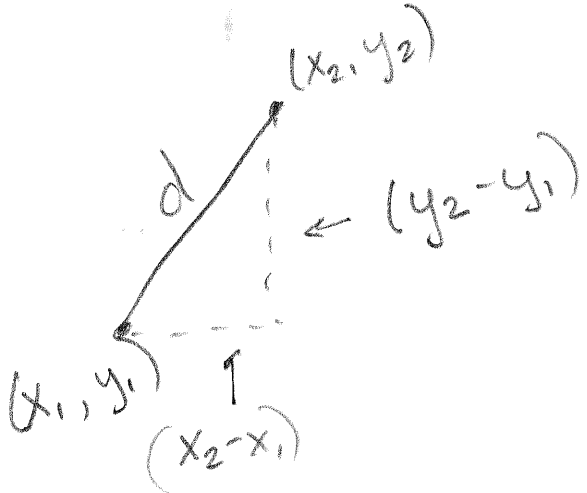

$d^2 = 5^2 + 7^2$

$d^2 = 25 + 49$

$d^2 = 74$

$\boxed{d = \sqrt{74}}$

74
2 | 37




$d^2 = (x_2 - x_1)^2 + (y_2 - y_1)^2$

$\boxed{d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}}$

distance formula

#118 Find distance between $(-1, 2)$ & $(5, 3)$ ($x_1, y_1$ and $x_2, y_2$)

$d = \sqrt{(5 + 1)^2 + (3 - 2)^2}$

$d = \sqrt{6^2 + 1^2}$

$d = \sqrt{36 + 1} = \boxed{\sqrt{37}}$