# Warm-Up

① $-\cancel{\sqrt{8^2}} + \cancel{\sqrt{5^2}} = -8 + 5$

$= \boxed{-3}$

② $\sqrt{(-6^2 + 10^2)} = \sqrt{-36+100}$

$(-6)^2 = -6 \times -6$
$= +36$

$-6^2 = -6 \times 6$
$= -36$

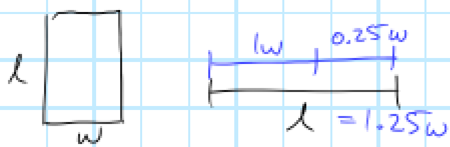
$= \sqrt{64}$

$= \boxed{8}$

③ $(\sqrt{9} + \sqrt{4})^2 = (3+2)^2 \Rightarrow \cancel{3^2 + 2^2 = 13}$

$= (5)^2 = \boxed{25}$

## Section 1.2 HW (pg 10)

9) 


$A = l \times w = 80$

$= (1.25)w \times w = 80$

$1.25w^2 = 80$

$w^2 = \frac{80}{1.25} = \sqrt{64} = \sqrt{w^2}$

$w = \sqrt{64} = 8$

$w = 8$

$l = 1.25(8)$

$l = 10$

13) 


$A_{circle} = \pi r^2$

$A_{\frac{1}{2} circle} = \frac{\pi r^2}{2}$

$\frac{\cancel{\pi} r^2}{2} = 32\cancel{\pi}$

$\Rightarrow \frac{r^2}{\cancel{2}} = 32 \times 2$

$\sqrt{r^2} = \sqrt{64}$

$r = 8$

$d = 2r$

$\boxed{d = 16}$

16) $C = 600\sqrt{A}$

i) $\frac{1200}{600} = \frac{\cancel{600}\sqrt{A}}{\cancel{600}}$

$(2)^2 = (\sqrt{A})^2 \Rightarrow A = 2^2$

$2^2 = \boxed{A = 4}$

# Math 9 Section 1.3 – Pythagorean Theorem

**Homework:** Section 1.3; 1-3 all, 6-7 even, 8-11 – Answers on Pg. 362

*(Don't use a calculator for questions in #2 and #3)*

From last classes, we know we can calculate square roots with our calculator, but how do we estimate square roots if the number isn't a perfect square?

*Example:* Estimate $\sqrt{14}$ **without** a calculator!

$\sqrt{9} < \sqrt{14} < \sqrt{16}$

$3 < \sqrt{14} < 4$


Guess: 3.7, 3.8

Check:

$(3.7)^2 = 13.69$

$(3.8)^2 = 14.44$

$\sqrt{14}$ is between 3.7 and 3.8

For each example below, without a calculator determine…

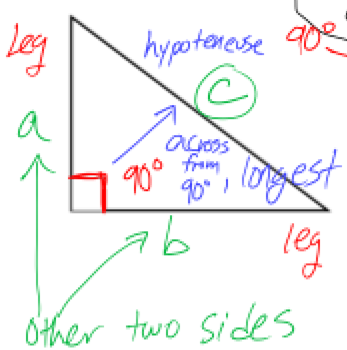
1) between which two integers is the value of the square root?
2) which one is it closer to?

$10^2 = 100,\ 11^2 = 121$

$12^2 = 144,\ 13^2 = 169$

| $\sqrt{39}$ | $\sqrt{162}$ | $-\sqrt{105}$ |
|---|---|---|
| $\sqrt{36} < \sqrt{39} < \sqrt{49}$ | $\sqrt{144} < \sqrt{162} < \sqrt{169}$ | $\sqrt{100} < \sqrt{105} < \sqrt{121}$ |
| $6 < \sqrt{39} < 7$ | $12 < \sqrt{162} < 13$ | $-10 > -\sqrt{105} > -11$ |
| $\sqrt{39}$ is closer to 6 | Closer to 13 | Closer to −10 |
| because 39 is closer to 36 | because 162 is closer to 169 | because 105 closer to 100 |

**Pythagorean Theorem:**




90° → Right triangles

① $a^2 + b^2 = c^2$ (solve for c)

$\cancel{a^2}$ $\cancel{-a^2}$ $-a^2$

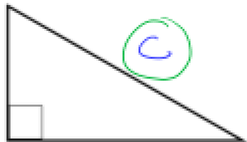
② $b^2 = c^2 - a^2$ (Solve for b)

③ $a^2 = c^2 - b^2$ (Solve for a)

***How to solve for missing side of a right triangle***

1) Label each side of the triangle with the letters a, b, c  Be careful!
2) Figure out which equation to use
3) Put in numbers and simplify the right-hand side
4) Don't forget to square root at the end!

Solve for the missing side exactly, then to one decimal place (if needed):




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

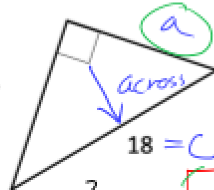
$c^2 = 5^2 + 12^2$

$c^2 = 25 + 144$

$c^2 = 169$

$\sqrt{c^2} = \sqrt{169}$

$\boxed{c = 13}$




$a^2 = c^2 - b^2$

$a^2 = 18^2 - 13^2$

$a^2 = 324 - 169$

$a^2 = 155$

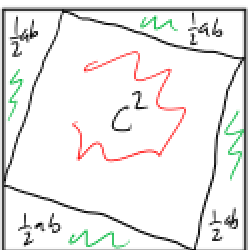
$\sqrt{a^2} = \sqrt{155}$

$\boxed{a = \sqrt{155}}$ exact

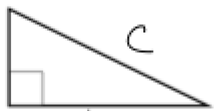
$\boxed{a = 12.4}$ 1 decimal place

**Proof for Pythagorean Theorem:** Try to find 2 ways to cover the white square

#1)



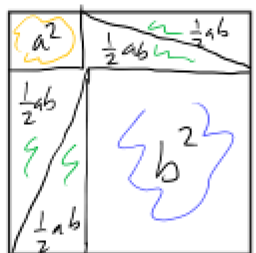

#3) Label the sides of the green triangle




Area $= \frac{1}{2}$ base $\times$ height

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

#2)




$-4(\frac{1}{2}ab)$   $-4(\frac{1}{2}ab)$

$$c^2 + \cancel{4(\tfrac{1}{2}ab)} = a^2 + b^2 + \cancel{4(\tfrac{1}{2}ab)}$$

$$c^2 = a^2 + b^2 \text{ !!}$$