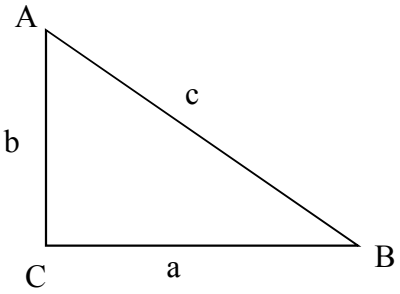
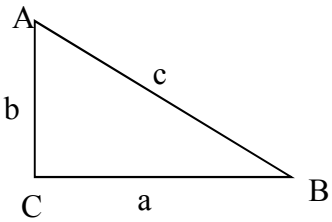
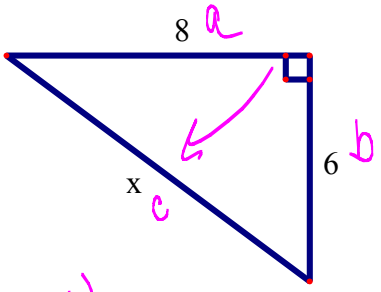
Name:_____Teacher:_____Period:_____Date:_____

830 9.4 GEOMETRY'S MOST ELEGANT THEOREM
STUDENT GUIDED NOTES

Theorem 69	The square of the measure of the hypotenuse of a right triangle is equal to the sum of the squares of the measures of the legs.	**Pythagorean Thm.**  $a^2+b^2=c^2$
Theorem 70	If the square of the measures of one side of a triangle equals the sum of the squares of the measures of the other sides, then the angle opposite the longest side is a right angle. * hypotenuse is always longest	If $a^2+b^2=c^2$, then this is a right triangle with $\measuredangle C$ as the right angle.
		$a^2+b^2>c^2$ $\measuredangle C$ *Acute* $a^2+b^2=c^2$ $\measuredangle C$ *Right* $a^2+b^2<c^2$ $\measuredangle C$ *Obtuse*

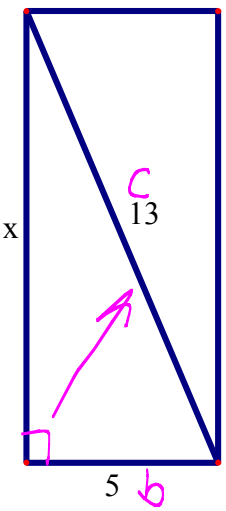
1. *Solve for x.*



$x^2=8^2+6^2$
$x^2=64+36$
$\sqrt{x^2}=\sqrt{100}$
$x=\pm 10$ (reject -10)
$x=10$

2. *Find the perimeter of the rectangle shown.*

$x^2+5^2=13^2$
$x^2+25=169$
$\sqrt{x^2}=\sqrt{144}$
$x=\pm 12$ (reject -12)
$x=12$



$12+12+5+5=34$

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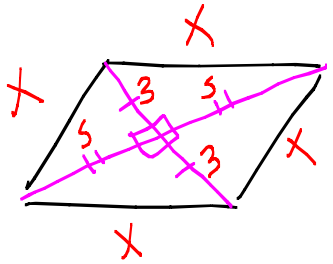
3. *Find the perimeter of a rhombus with diagonals of* 6 *and* 10.



$x^2 = 3^2 + 5^2$

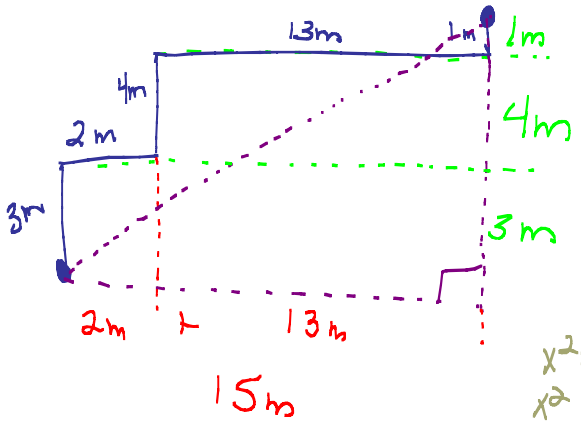
$x^2 = 9 + 25$

$\sqrt{x^2} = \sqrt{34}$

$x = \sqrt{34}$

$P = 4\sqrt{34}$

4. *Nadia skipped* 3m *north*, 2m *east*, 4m *north*, 13 m *east, and* 1 m *north. How far is Nadia from where she started?*



8m

N
W
E
S

$x^2 = 15^2 + 8^2$

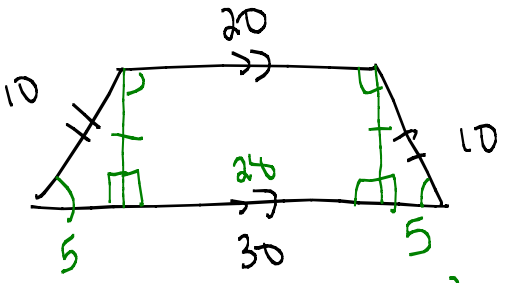
$x^2 = 225 + 64$

$x^2 = 289$

$x = \pm 17$

$x = 17m$

5. *Find the altitude of an isosceles trapezoid whose sides have lengths of* ~~10~~, ~~30~~, ~~10~~, *and* ~~20~~.



$10^2 = 5^2 + x^2$

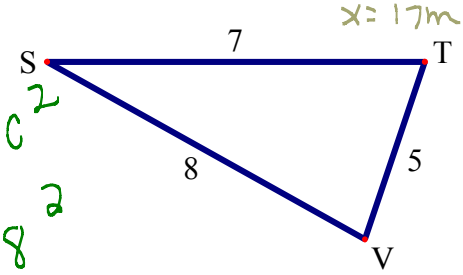
$100 = 25 + x^2$

$\sqrt{75} = \sqrt{x^2}$

$\pm 5\sqrt{3} = x$

$5\sqrt{3} = x$

6. *Classify the triangle shown.*



$a^2 + b^2 \bigcirc c^2$

$7^2 + 5^2 \bigcirc 8^2$

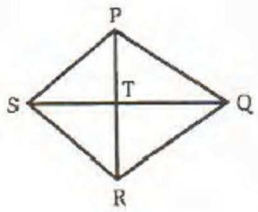
$49 + 25 \bigcirc 64$

$74 > 64$

acute

Scalene

7. PQRS is a kite.
$\overline{SP} \perp \overline{PQ}$
$\overline{PS} \cong \overline{SR}$
PR = 12, SQ = 13
Find ST, SP, PQ, perimeter.



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