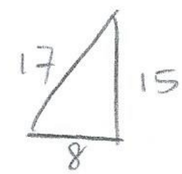
MATH 0270/1314 COLLEGE ALGEBRA Week 9 Tuesday 4/2/19

- Determine if a triangle is a right triangle



  - use Pythagorean Theorem $a^2+b^2=c^2$ (c → long edge)
  - check if $17^2 = 15^2 + 8^2$ ✓

- Midpoint & distance formula.

(x_1, y_1), (x_2, y_2), midpoint $= \left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$

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

e.g. $(-3, 2)$ $(5, 15)$

distance $= \sqrt{(5-(-3))^2+(15-2)^2} = \sqrt{8^2+13^2} = \sqrt{233} \approx 15.26$

Practice to check for a right triangle.

$$\boxed{a^2+b^2=c^2}$$

(1).

$6^2+8^2 = 48+64 = 100$

$11^2 = 121 \neq 100$ NO.

(2)

$21^2+20^2 = 441+400 = 841$

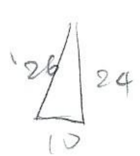
$29^2 = 841 = 21^2+20^2$ YES

(3)

$14^2+48^2 = 196+2304 = 2500$.

$50^2 = 2500 = 14^2+48^2$ YES

(4)



$10^2+24^2 = 100+576 = 676$

$26^2 = 676 = 10^2+24^2$ YES.

(5) $a=5$, $b=$ ___, $c=13$

$b^2 = 13^2-5^2 = 169-25 = 144$

$b = \sqrt{144} = 12$

(6). $a = 16$, $b = 30$, $c =$ ____

$a^2 + b^2 = 16^2 + 30^2 = 256 + 900 = 1156 = c^2$

$c = \sqrt{1156} = 34$

(7) $a = 9$, $b =$ ____, $c = 15$.

$b^2 = c^2 - a^2 = 15^2 - 9^2 = 225 - 81 = 144$

$b = \sqrt{144} = 12$

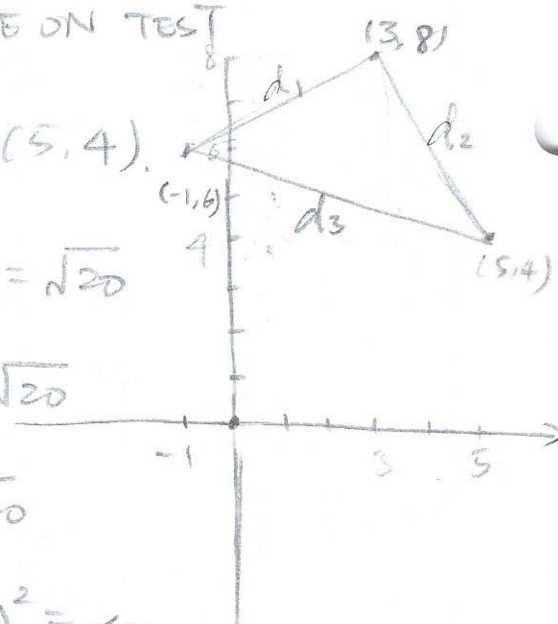
(8). $a = 7$, $b = 24$, $c =$ ____

$a^2 + b^2 = 7^2 + 24^2 = 49 + 576 = 625$

$c = \sqrt{625} = 25$.

WEBASSIGN P.6-7. #1 WILL BE ON TEST

Right Triangle: $(-1,6)$, $(3,8)$, $(5,4)$.



isosceles

$d_1 = ((3-(-1))^2 + (8-6)^2)^{\frac{1}{2}} = \sqrt{4^2 + 2^2} = \sqrt{20}$

$d_2 = ((5-3)^2 + (4-8)^2)^{\frac{1}{2}} = \sqrt{2^2 + (-4)^2} = \sqrt{20}$

$d_3 = [(5-(-1))^2 + (4-6)^2] = \sqrt{6^2 + (-2)^2} = \sqrt{40}$

observe that $d_1^2 + d_2^2 = (\sqrt{20})^2 + (\sqrt{20})^2 = 40$

$d_3^2 = (\sqrt{40})^2 = 40 = d_1^2 + d_2^2$

so it is a right triangle.