Unit J Review #2

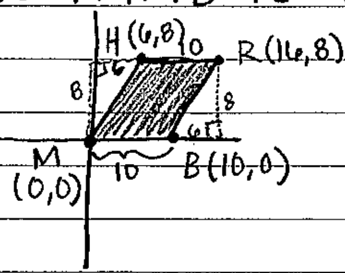
KEY!

p. 679 # 10 & 11
& p. 680 # 30, 31, 33, 34, 37, 38

$\boxed{\text{p. 679}}$

Pythag!
4 = sides (distance)

10. Prove RHMB is a rhombus.



RB length: $6^2+8^2=100$, $\sqrt{100}=10$
MB length: 10
MH length: $6^2+8^2=100$, $\sqrt{100}=10$
HR length: 10

Since RB, MB, MH, & HR are all 10 units, RHBM is a rhombus because it has 4 equal sides.

ZX & WY
11. Prove the diagonals of XYZW have the same Midpoint.

XZ midpoint: $\left(\frac{\cancel{2a+2b}}{\cancel{2}}, \frac{\cancel{2c+0}}{\cancel{2}}\right) = (a+b, c)$

WY midpoint: $\left(\frac{\cancel{2a+2b+0}}{\cancel{2}}, \frac{\cancel{2c+0}}{\cancel{2}}\right) = (a+b, c)$

Since XZ & WY both have midpoint $(a+b, c)$, they are the same.

p. 680

30. Prove $\triangle ABC$ is not isosceles. ($2 = $ sides)

AB length: $1^2+12^2 = 145$, $\sqrt{145} = 12.04$
AC length: $4^2+11^2 = 137$, $\sqrt{137} = 11.7$
BC length: $10^2+8^2 = 164$, $\sqrt{164} = 12.8$

Since no 2 sides are $=$, $\triangle ABC$ is not isosceles.

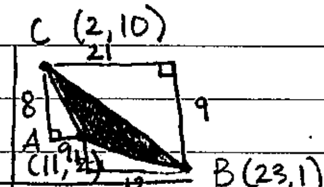
31. Prove that ABCD is not a trapezoid. (one pair of // sides; same slope)

AB slope: $\frac{11-1}{6--2} = \frac{10}{8} = \frac{5}{4}$
BC slope: $\frac{11-8}{6-11} = \frac{3}{-5} = -\frac{5}{3}$
DC slope: $\frac{8--4}{11--3} = \frac{12}{14} = \frac{6}{7}$
AD slope: $\frac{1--4}{-2--3} = \frac{5}{1} = 5$

Since no slopes are the same, there are no // sides so ABCD is not a trapezoid.

33. Prove $\triangle ABC$ is isosceles. ($2 = $ sides)

AB length: $1^2+12^2 = 145$, $\sqrt{145} = 12.04$
BC length: $9^2+21^2 = 522$, $\sqrt{522} = 22.8$
AC length: $8^2+9^2 = 145$, $\sqrt{145} = 12.04$



Since AB = 12.04 & AC = 12.04, there are 2 equal sides. So, $\triangle ABC$ is isosceles.

34. Prove $\triangle XYZ$ is a right triangle.
$90° \rightarrow \perp$ (opp. /rec. slopes)

XY slope: $\frac{q-0}{0-q} = \frac{q}{-q} = -1$

YZ slope: $\frac{3q-q}{2q-0} = \frac{\cancel{2q}}{\cancel{2q}} = 1$

XZ slope: $\frac{3q-0}{2q-q} = \frac{3\cancel{q}}{\cancel{q}} = 3$

Since XY & YZ have opp/rec. slopes they are $\perp$ so $\triangle ABC$ is a right triangle.

37. Prove the diagonals are $\perp$. ↙ opp/rec. slopes

↳ XZ & YW

XZ slope : $\frac{0-s}{s-0} = \frac{-s}{s} = -1$

YW slope: $\frac{s-0}{s-0} = \frac{s}{s} = 1$

Since the slopes are opp/rec., XZ is $\perp$ to YW.

38. Prove the diagonals have the same length. ↱ Pythag

↳ ZX & YW

XZ length : $s^2 + s^2 = 2s^2$, $\sqrt{2s^2}$

YW length: $s^2 + s^2 = 2s^2$, $\sqrt{2s^2}$

Since the lengths are the same, XZ = YW.