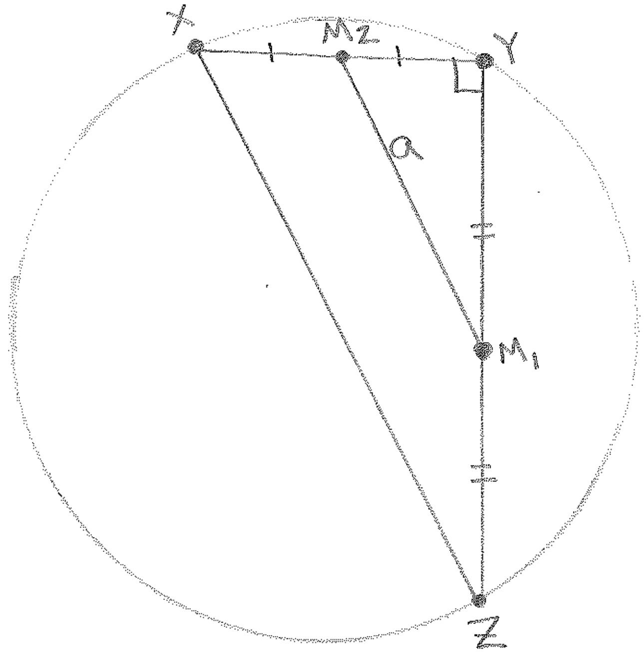
(19.)



By Thale's theorem if you have a right triangle inscribed in a circle then two points must lie on the diameter.

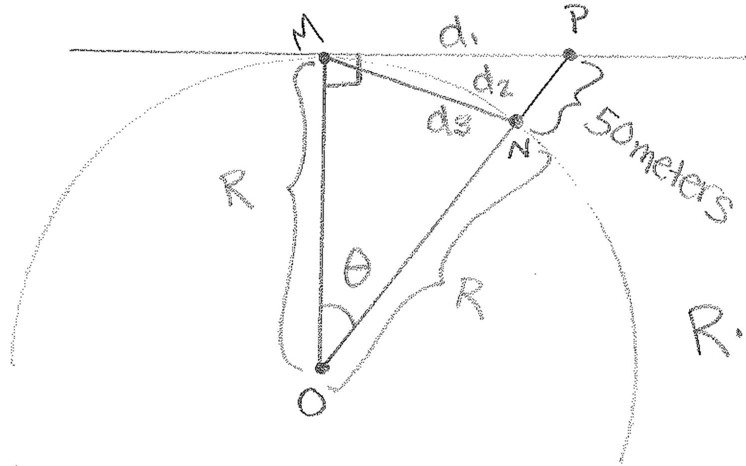
By construction $\angle XYZ$ is a right angle and X, Y, Z lie on the circle. Thus $\triangle XYZ$ has two points that lie on the diameter. Since XY and YZ are arbituarly choosen cords $\overline{XZ}$ must be the diameter of the circle. Now since $\overline{XY} = 2\overline{M_2Y}$ and $\overline{YZ} = 2\overline{M_1Y}$, $\triangle XYZ$ is similar to $\triangle M_2YM_1$ and $\triangle XYZ$ differs from $\triangle M_2YM_1$ by a 2:1 ratio. Therefore $a = \frac{1}{2} \cdot$ diameter $\Rightarrow$ a = radius.

good!

Maher, Annie   Math 128A   HW #4

(4.2) Find the radius of the planet:

4.2 | 5.
19 | 5.



$R \cdot \theta = 2{,}000$ meters $= d_2$

$\measuredangle OMP = 90°$ since the line through $\overline{MP}$ is tangent to the circle at pt. M.

Also $d_1 \approx d_2 \approx d_3 \approx 2{,}000$ meters by the small $\measuredangle$ approximation on θ. If $\theta \approx \pi/2$ then the mass height would be ∞. Hence θ is small.

Now by the Pythagorean theorem,

$$R^2 + 2000^2 = (R+50)^2$$

$$\Rightarrow \quad R^2 + 4{,}000{,}000 = R^2 + 100R + 2500$$

$$\Rightarrow \quad 100R = 3{,}997{,}500$$ pretty slick

$$\Rightarrow \quad R = 39{,}975$$

Hence the radius of the planet is approximatly 39,975 meters.