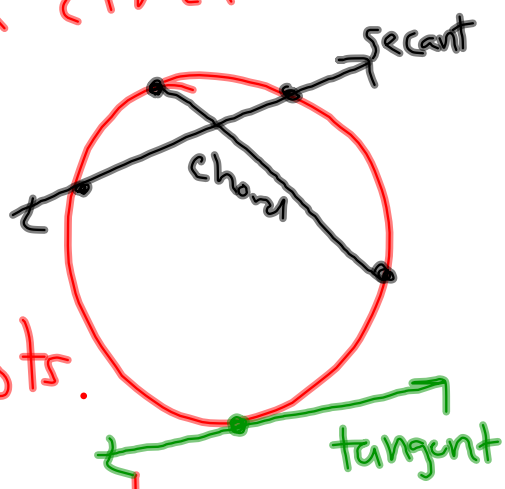
There is a bomb in the city of Appleton. If the bomb goes off, everyone in Appleton will die, and there is no way out of the city. The only way to stop the bomb and save everyone is to find the person who made the bomb so they can tell you where it is. You are the top cop in the city, and it just so happens that you think that you know who this person is. You take this person in for questioning and the person denies everything. After awhile, the person just stops talking. You only have 1 hour to find the bomb before it goes off. Although the man denies it, you are pretty sure that this person is guilty. Do you think it is ok to torture this person in order to find the bomb?

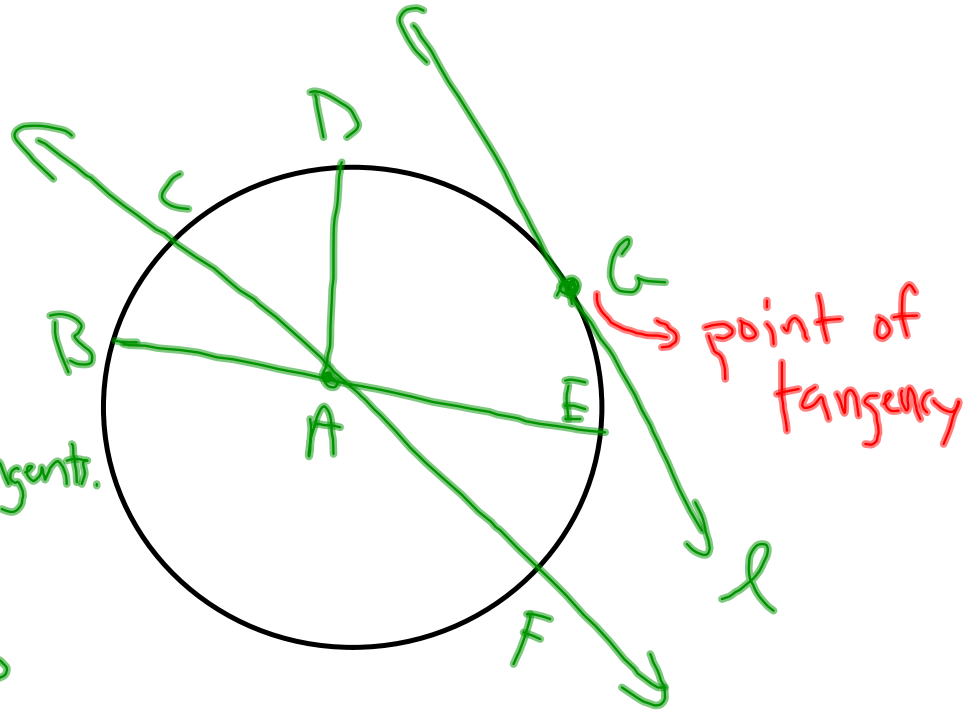
11.1 lines that intersect circles

chord: segment whose endpts. lie on the circle.

secant: a line that intersects a circle in 2 pts.



tangent: a line that intersects a circle in exactly 1 pt.



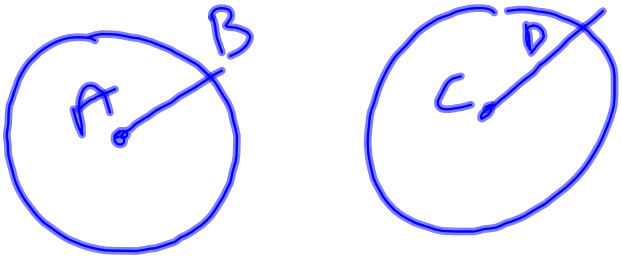
Name chords secants & tangents.

chords: $\overline{BE}$

secants: $\overleftrightarrow{CF}$

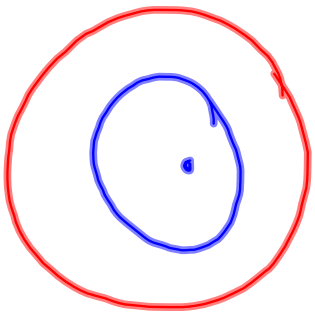
tangents: line l

Congruent circles: circles with $\cong$ radii.

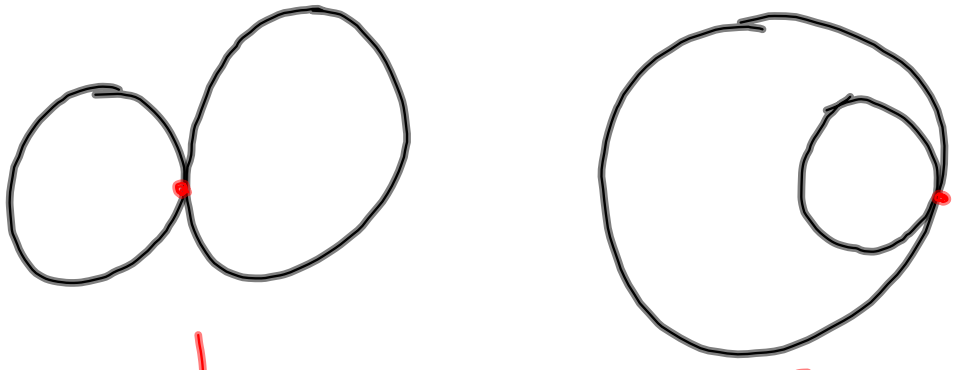


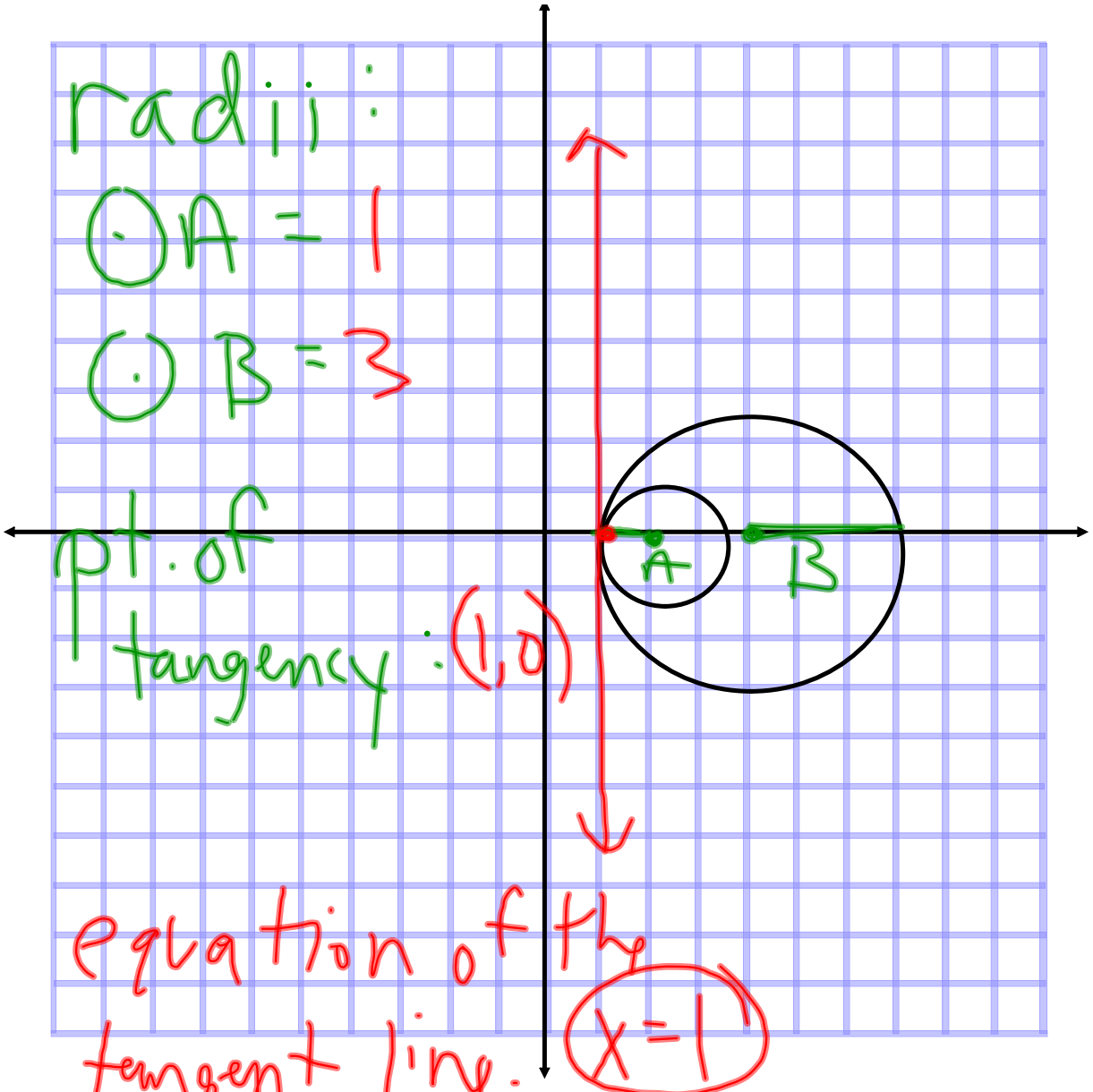
$\overline{AB} \cong \overline{CD}$
then $OA \cong OC$

Concentric circles: coplanar circles with the same center



tangent circles: two coplanar circles that intersect in 1 pt.

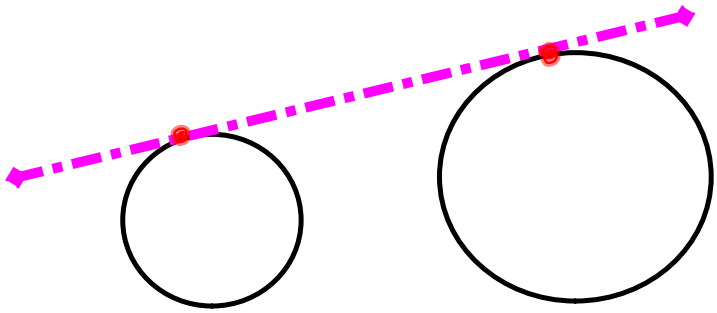




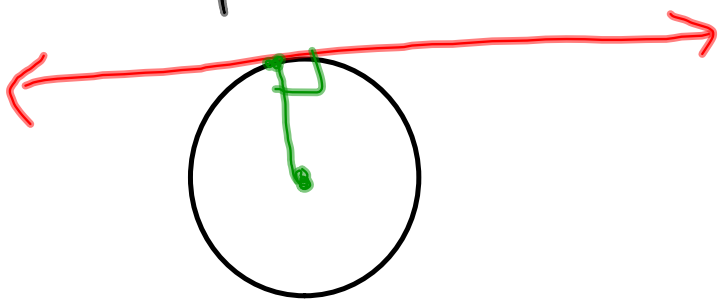
$x=a$ vertical line

$y=b$ horizontal line

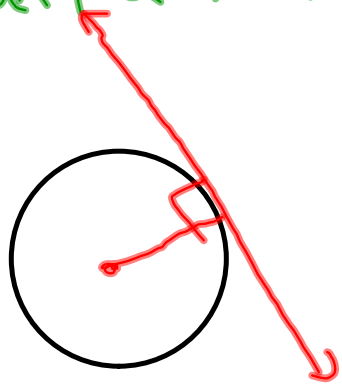
Common tangent: line that is tangent to 2 circles



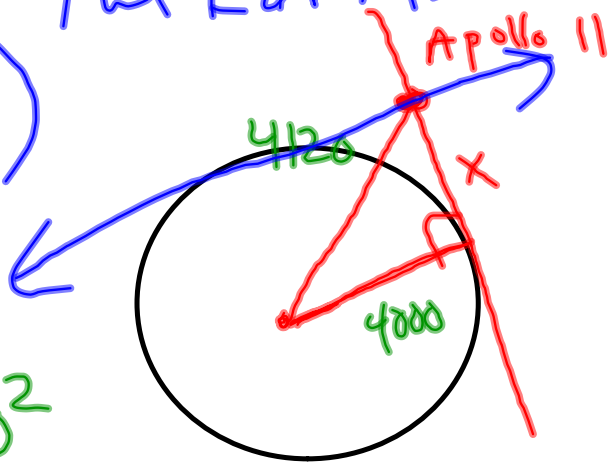
Theorem 11-1-1: if a line is tangent to a circle, then the line is $\perp$ to the radius at the pt. of tangency.



Theorem 11-1-2: If a line is $\perp$ to the radius of a circle, then that the line is a tangent.



The Apollo 11 orbited the Earth at an altitude of 120 miles. What was the distance from the spacecraft to the Earth's horizon rounded to the nearest mile? (Hint: the Earth's radius is 4000 mi.)



$4000^2 + x^2 = 4120^2$

$16{,}000{,}000 + x^2 = 16{,}974{,}400$

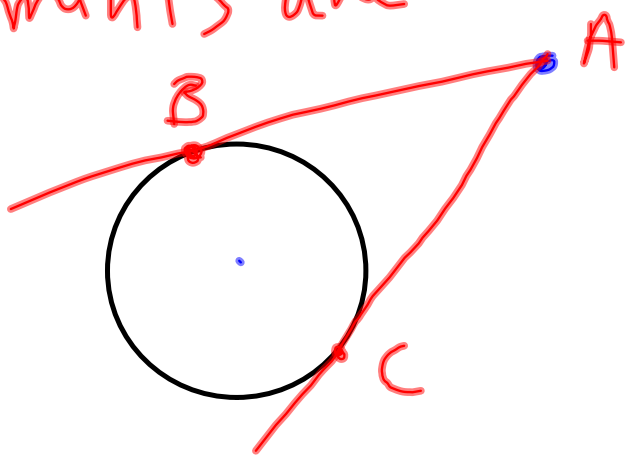
$-16{,}000{,}000 \quad -16{,}000{,}000$

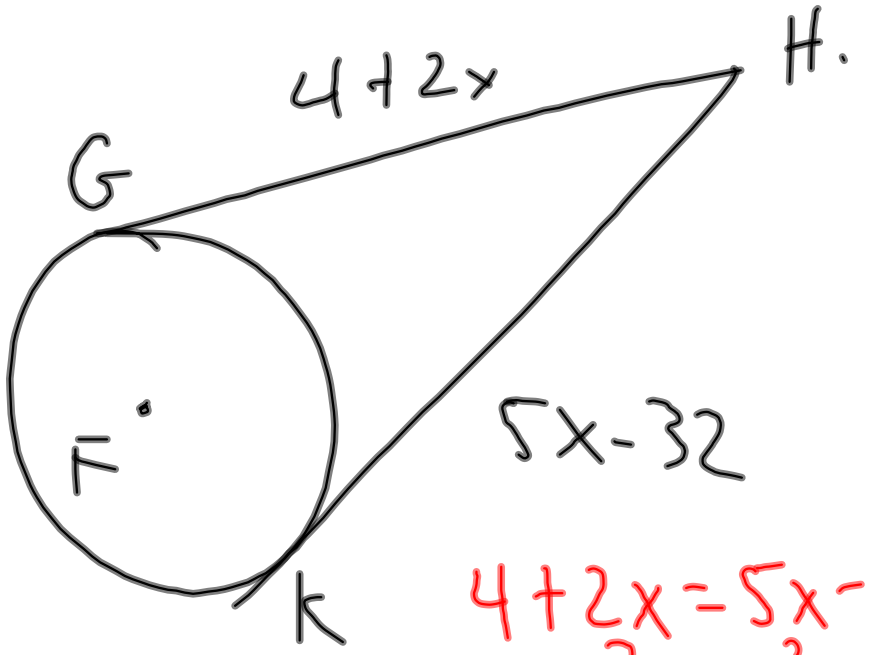
$\sqrt{x^2} = \sqrt{974{,}400}$

$x = 987.1$ miles

Theorem 11-1-3: if 2 segments are tangent to a circle from the same exterior pt., then those segments are $\cong$.

$\overline{AB} \cong \overline{AC}$





Find HG.

$HG = 4 + 2x$

$= 4 + 2(12)$

$= 28$

$4 + 2x = 5x - 32$

$-2x \quad -2x$

$4 = 3x - 32$

$+32 \quad +32$

$36 = 3x$

$\frac{36}{3} = \frac{3x}{3}$

$x = 12$

p. 751

1-26, skip 15