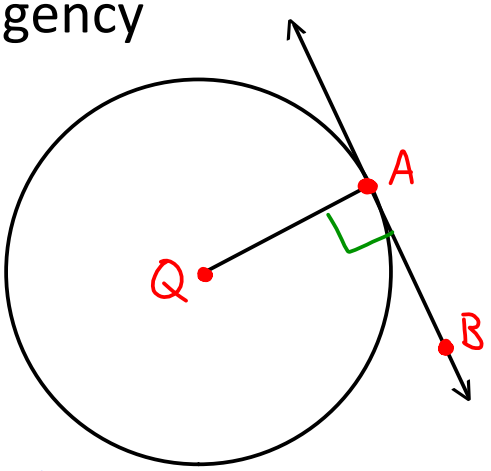
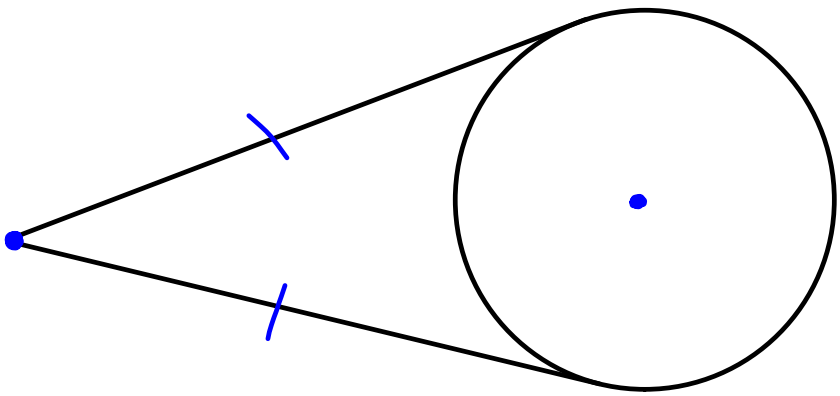
Theorem:
If a line is tangent to a circle, then it is perpendicular to the radius drawn to the point of tangency



IF $\overleftrightarrow{AB}$ IS TANGENT TO $\odot Q$

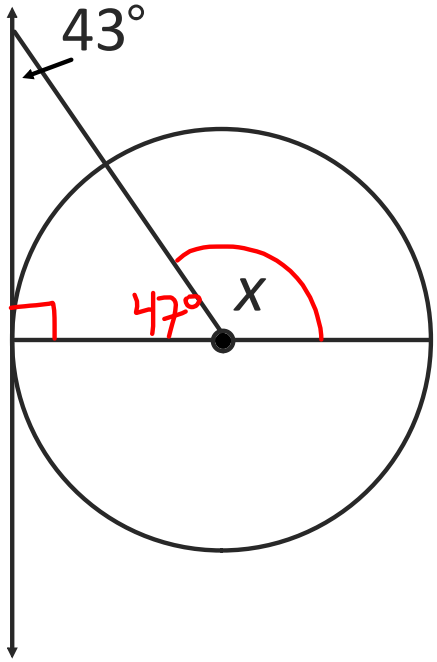
THEN $\overline{QA} \perp \overleftrightarrow{AB}$

Theorem:
If two segments from the same exterior point are tangent to a circle, then they are congruent.



Lesson 2 - Properties of Tangents Marked

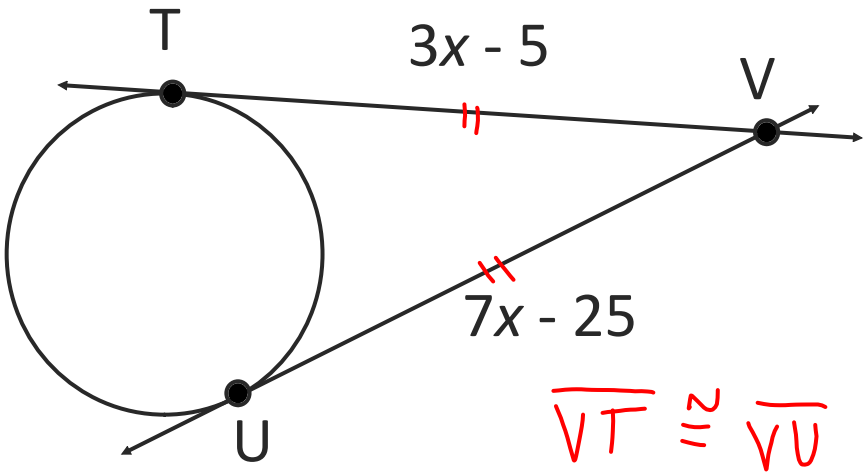
Find the value of x



$47 + x = 180$

$x = 133$

Find the value of x



$\overline{VT} \cong \overline{VU}$

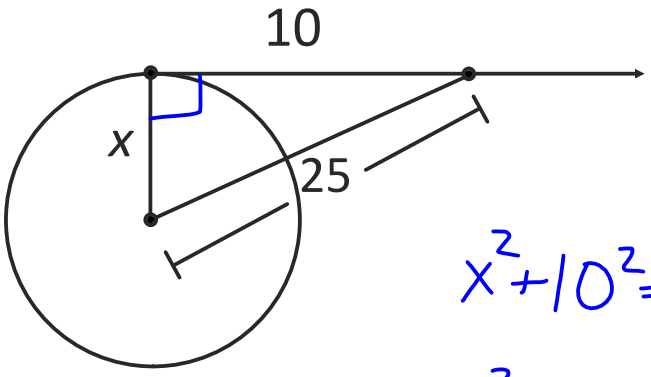
$3x - 5 = 7x - 25$

$20 = 4x$

$x = 5$

Lesson 2 - Properties of Tangents Marked

Find the value of *x*



$x^2+10^2=25^2$

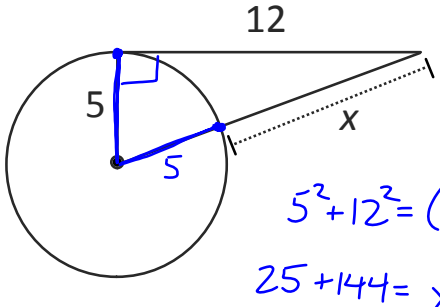
$x^2+100=625$

$x^2=525$

$x=\sqrt{25\cdot 21}$

$x=5\sqrt{21}$

Find the value of *x*



$(x+5)(x+5)$

$x^2+5x+5x+25$

$x^2+10x+25$

$5^2+12^2=(x+5)^2$

$25+144=x^2+10x+25$

$0=x^2+10x-144$

2 #'s MULT = -144
ADD = 10

18 AND -8

$(x+18)(x-8)=0$

$x+18=0$

$x=-18$

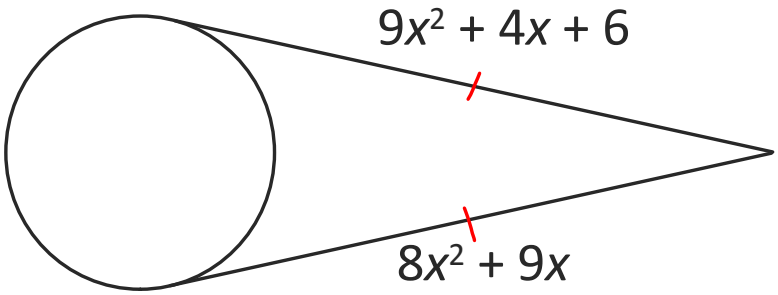
EXTRANEOUS

$x-8=0$

$x=8$

Lesson 2 - Properties of Tangents Marked

Find the value of x



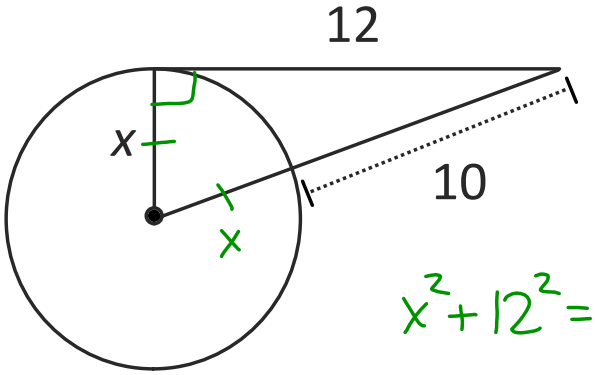
$9x^2+4x+6=8x^2+9x$

$x^2-5x+6=0$

$(x-2)(x-3)=0$

$x=2 \quad x=3$

Find the value of x



$x^2+12^2=(x+10)^2$

$x^2+144=x^2+20x+100$

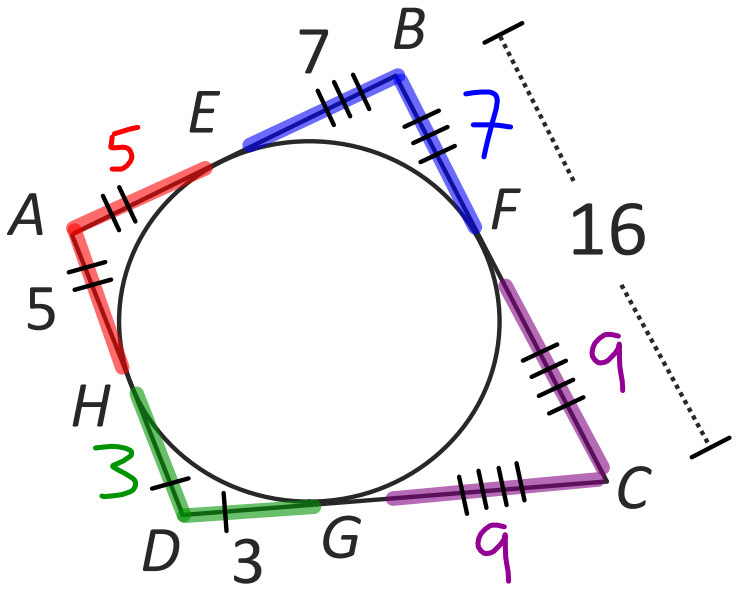
$144=20x+100$

$44=20x$

$x=\frac{11}{5}$

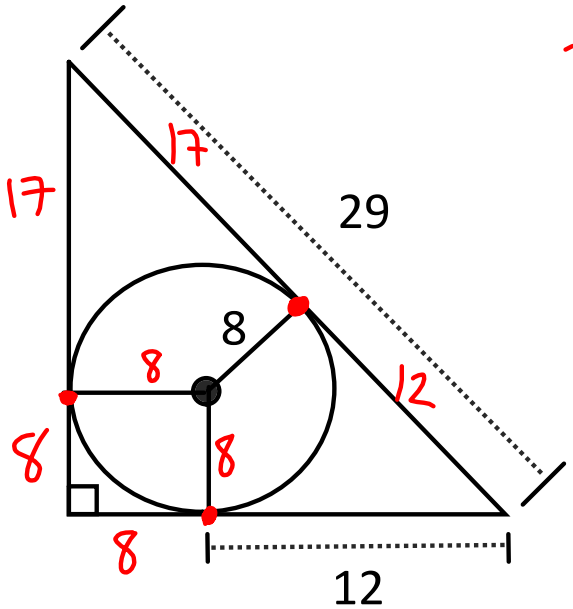
Lesson 2 - Properties of Tangents Marked

Find the perimeter of *ABCD*



PERIMETER = 16+12+8+12 = 48 u

Find the perimeter and area of the triangle



P = 29+25+20

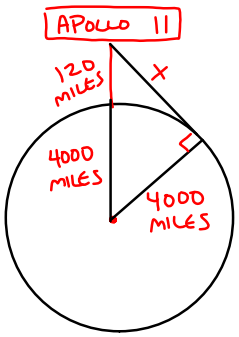
= 74 u

$A = \frac{1}{2}(20)(25)$

$= 250\ u^2$

Lesson 2 - Properties of Tangents Marked

Early in its flight, the Apollo 11 spacecraft orbited Earth at an altitude of 120 miles. Given that the radius of the earth is approximately 4000 miles, what was the distance from the spacecraft to the Earth's horizon (rounded to the nearest mile).



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

$x^2+16000000=16974400$

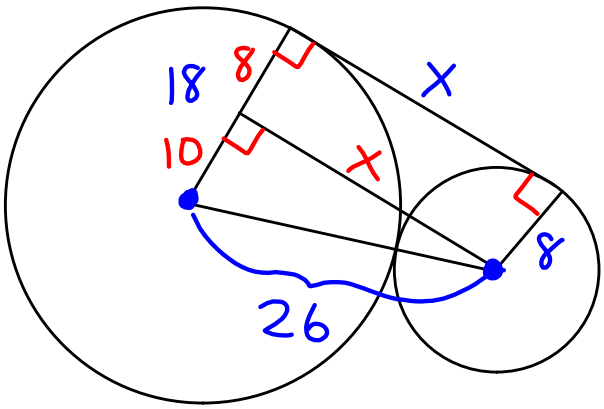
$x^2=974400$

$x=\sqrt{974400}$

$x\approx 987.117$

∴ APOLLO 11 IS APPROX 987 MILES FROM THE HORIZON.

A circle with radius of 8 is externally tangent to a circle with radius of 18. Find the length of the common external tangent segment.



$x^2+10^2=26^2$

$x^2+100=676$

$x^2=576$

$x=24$