The measure of two angles are given. Find the measure of the third angle.

23.

$37°, 52°$

$180°$
$- 37$
————
$143°$
$- 52°$
————
$\boxed{91°}$

25.

$147° 12', 30° 19'$

$147° \ 12'$
$+ 30° \ 19'$
————————
$177 \ 31'$

180
$177 \ 31'$
————————
$2° \ 60'$
$- \ 31'$
————————
$\boxed{2° \ 29'}$

47.

$42°$
$+ 90°$
————
$132°$

$180°$
$- 132$
————
$\boxed{48°}$

$A\angle = Q\angle = 42°$
$C\angle = P\angle = 90°$
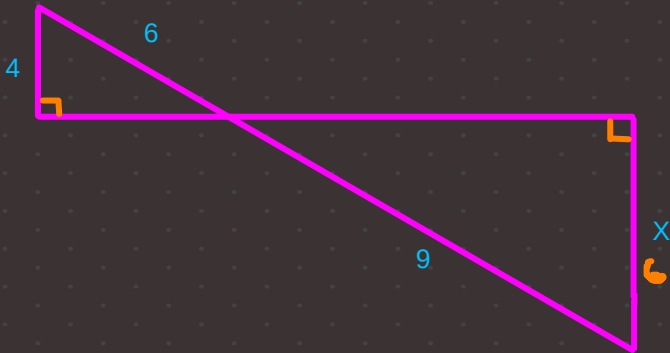$B\angle = R\angle = 48°$

53.

25   a   20

8   10

15   b   6
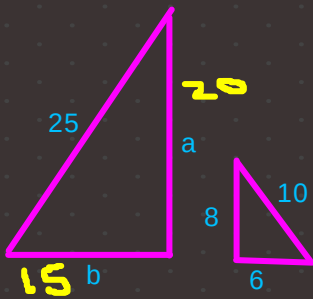
$$\frac{a}{25} = \frac{8}{10} \qquad 25\left(\frac{8}{10}\right) = a = 20$$

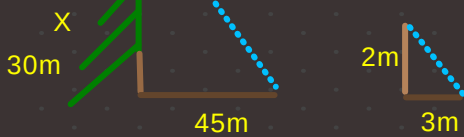$$\frac{b}{25} = \frac{6}{10} \qquad 25\left(\frac{6}{10}\right) = b = 15$$

57.

4   6   9   X   6

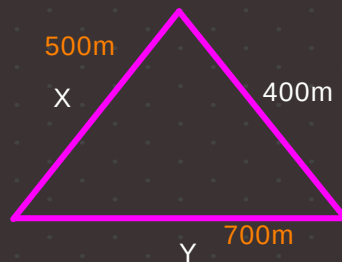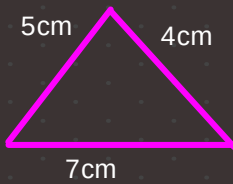$$\frac{4}{6} = \frac{x}{9}$$

$$9\left(\frac{4}{6}\right) = x = 6$$

59.

X   30m   45m   2m   3m

$$\frac{3m}{2m} = \frac{Xm}{45m}$$

$$45m\left(\frac{3m}{2m}\right) = x = 30m$$

61.

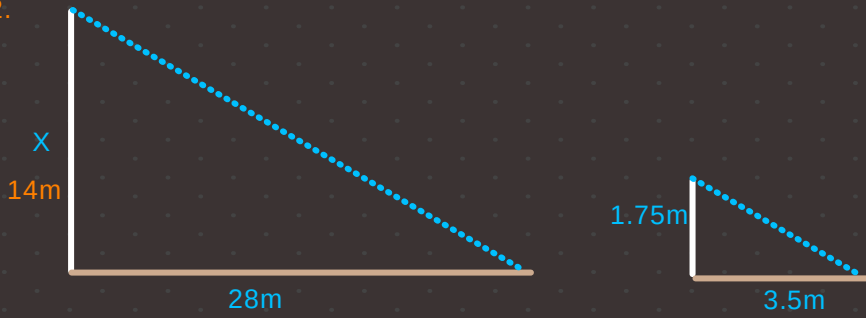5cm   4cm   7cm

500m   X   400m   700m   Y

$$\frac{7cm}{4cm} = \frac{y}{400m} \qquad 400m\left(\frac{7cm}{4cm}\right) = y = 700m$$

$$\frac{5cm}{4cm} = \frac{x}{400m} \qquad 400m\left(\frac{5cm}{4cm}\right) = x = 500m$$
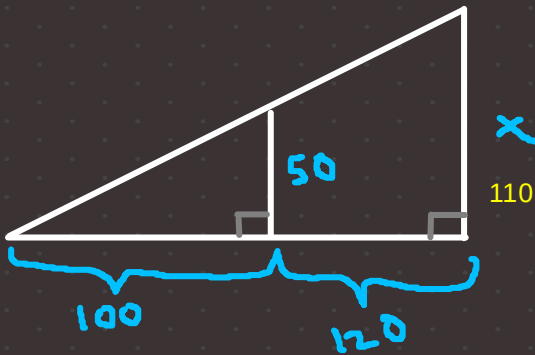
62.

X

14m

28m

1.75m

3.5m

$$\frac{x}{28m} = \frac{1.75}{3.5m}$$

$$28m\left(\frac{1.75m}{3.5m}\right) = x = 14m$$

65.

50

x

110

100

120

$$100 + 120 = 220$$

$$\frac{50}{100} = \frac{x}{220}$$

$$220\left(\frac{50}{100}\right) = x = 110$$

69.

Solar Eclipse on Earth

The Sun has a diameter of about 865k miles with a max distance from Earth's surface of about 94.5M miles. The moon has a smaller diameter of 2,149 miles. For a total solar eclipse to occur, the moon must pass between Earth and Sol. Luna must also be close enough to Earth for the umbra (shadow) to reach the surface of Earth.

A. Calculate the maximum distance, to the nearest thousand miles, that Luna can be from Earth and still have a total solar eclipse occur (use similar triangles).

B. The closest approach of Luna to Earth's surface was 225,745 miles and the farthest was 251,978 miles. Can a total solar eclipse occur every time Luna is between Earth and Sol?

Umbra Zone

865k mi

94.5M mi

2,149mi

X mi
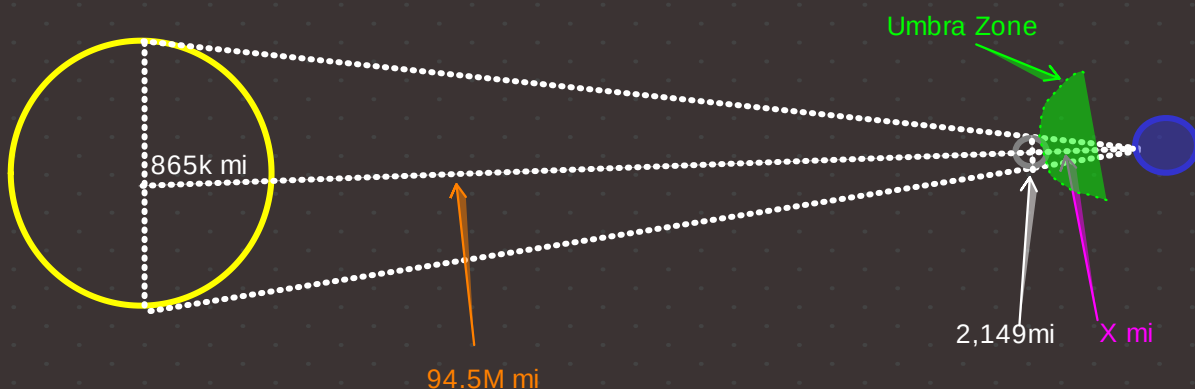
a)

$$\frac{94,500,000 \text{ mi}}{865,000 \text{ mi}} = \frac{X \text{ mi}}{2,149 \text{ mi}}$$

$$2,149 \text{ mi} \left(\frac{94.5M \text{ mi}}{865k \text{ mi}}\right) = X \approx 234,775 \text{ mi}$$

$$= \sim 235k \text{ mi}$$

b)

No, the maximum distance a total solar eclipse can occur is 234,775mi. Anything over 234,775 miles will be a solar eclipse, but it will not be a total solar eclipse being the moon is not completely blocking out the sun.