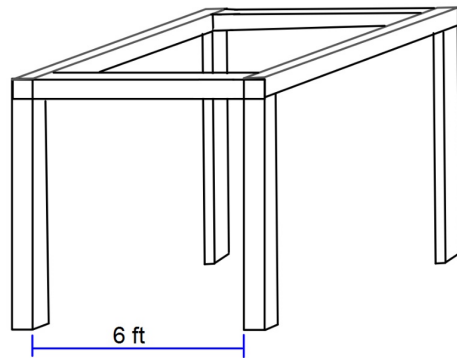When could you use trigonometry in "real-life"?

To build and design a shed like this one you'll need to know how to calculate angles and lengths so that boards are cut to proper lengths and angles in order to fit together correctly.

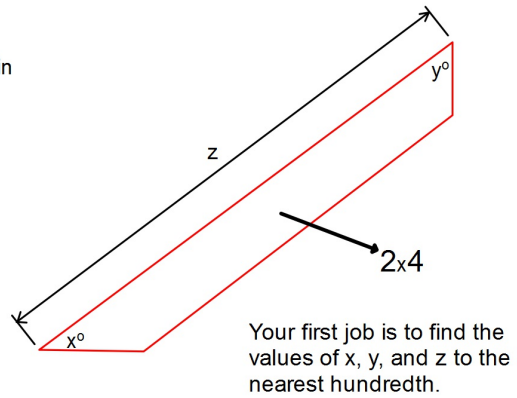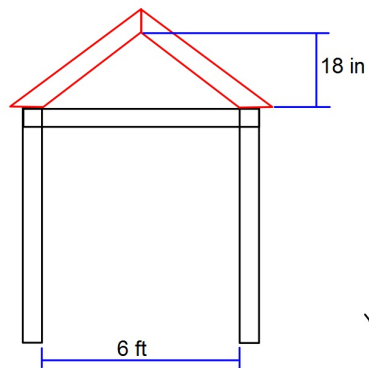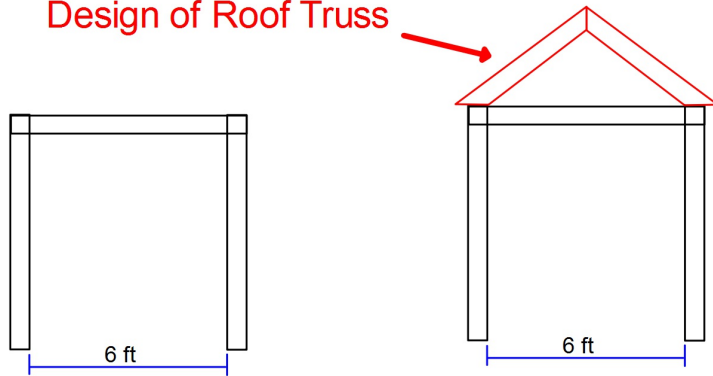The framing of the shed was done with 2x4's

6 ft

A piece of lumber called a 2x4 isn't actually 2" x 4".
The final dimensions after drying and planing are actually 1.5" x 3.5"

3.5 in

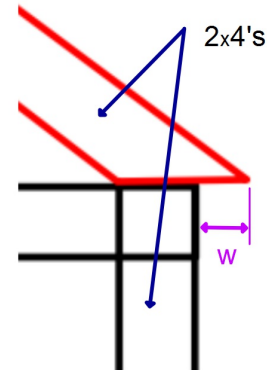All dimensions for the 2x4's shown in the following pages are the 3.5" dimension.

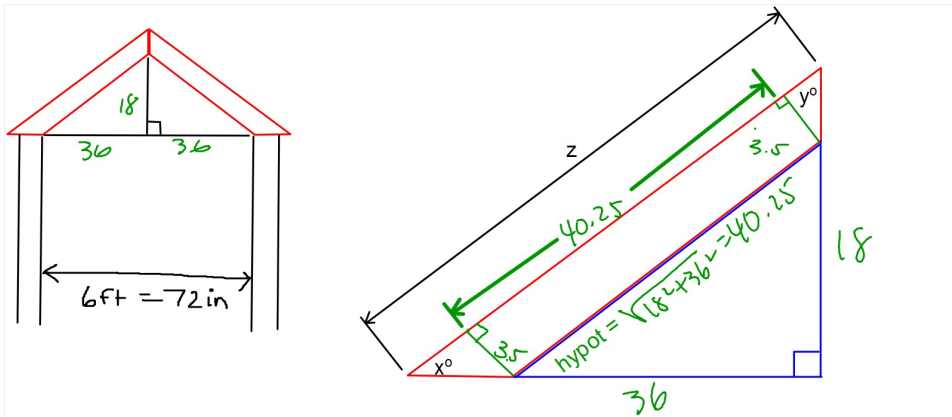**Design of Roof Truss**

6 ft

6 ft

18 in

6 ft

z

y°

x°

2x4

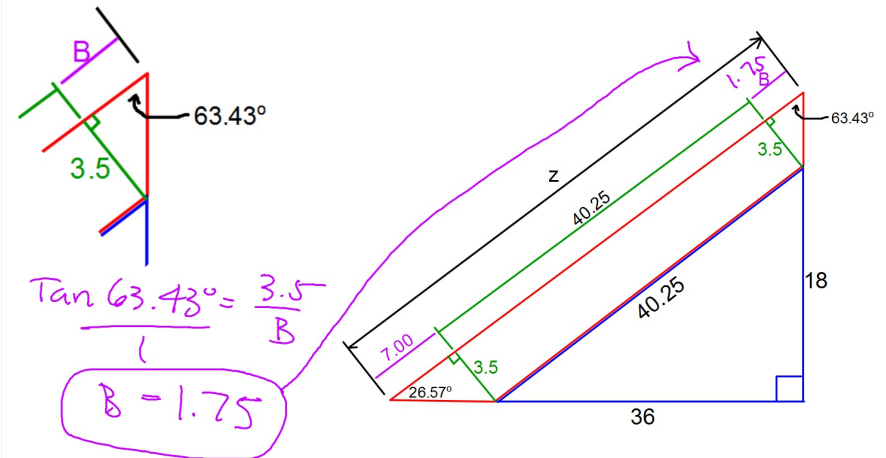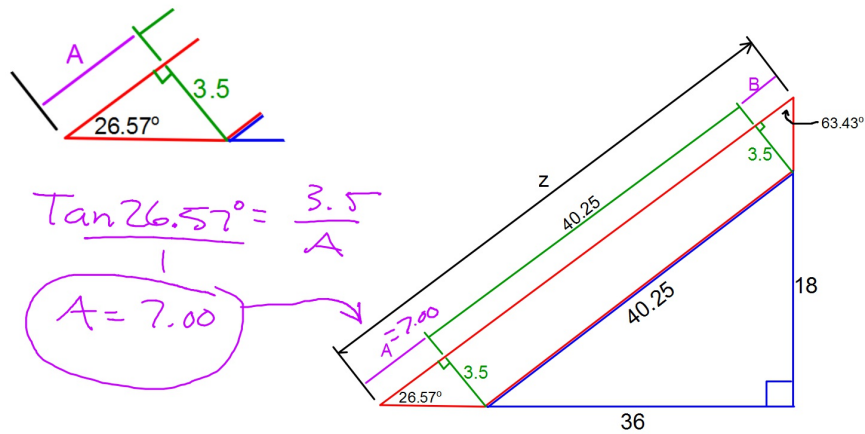Your first job is to find the values of x, y, and z to the nearest hundredth.

2x4's

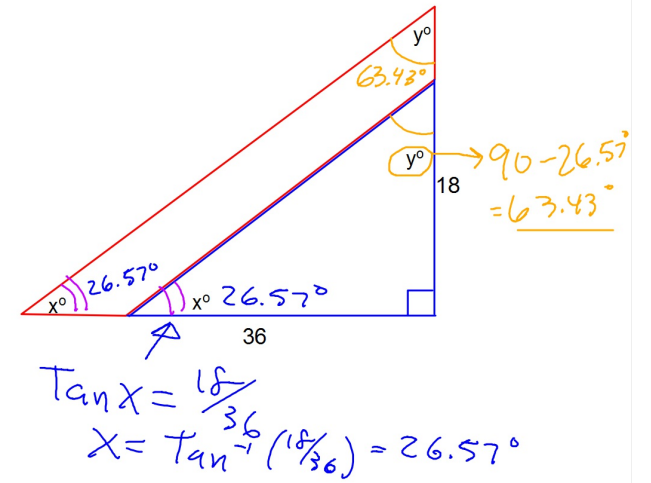Your second job is to find the amount of overhang (w).
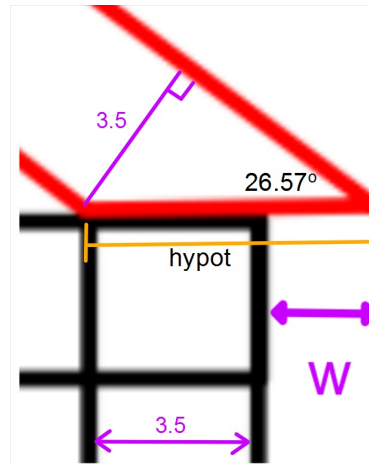
The name for this overhang is the EAVES.

w

Top-left panel

18

36 36

6ft = 72 in

z

40.25

3.5

3.5

$hypot = \sqrt{18^2 + 36^2} = 40.25$

40.25

18

36

$y°$

$x°$

Top-right panel

Now find angles x and y.

$y°$

63.43°

$y°$ → 90 − 26.57

= 63.43°

18

26.57°

$x°$

$x°$ 26.57°

36

$Tan X = \dfrac{18}{36}$

$X = Tan^{-1}\left(\dfrac{18}{36}\right) = 26.57°$

Bottom-left panel

A

3.5

26.57°

$Tan\,26.57° = \dfrac{3.5}{A}$ ÷ 1

$A = 7.00$

z

40.25

3.5

B

63.43°

40.25

18

A = 7.00

3.5

26.57°

36

Bottom-right panel

B

3.5

63.43°

$Tan\,63.43° = \dfrac{3.5}{B}$ ÷ 1

$B = 1.75$

1.75

B

z

40.25

3.5

63.43°

40.25

18

7.00

3.5

26.57°

36

z = 40.25 + 1.75 + 7.00 = 49"

x = 26.57°

y = 63.43°

$z = 49$

1.75

63.43°

3.5

40.25

40.25

18

7.00

3.5

26.57°

36

3.5

26.57°

hypot

W

3.5
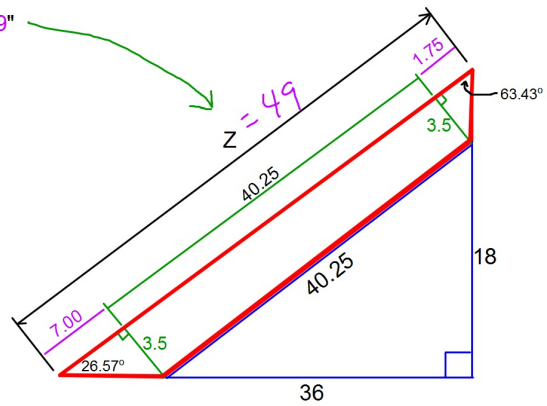
$$\sin 26.57° = \frac{3.5}{\text{hypot}}$$

hypot = 7.82 in

w = 7.82 - 3.8 = 4.32 in

Quiz Tomorrow!