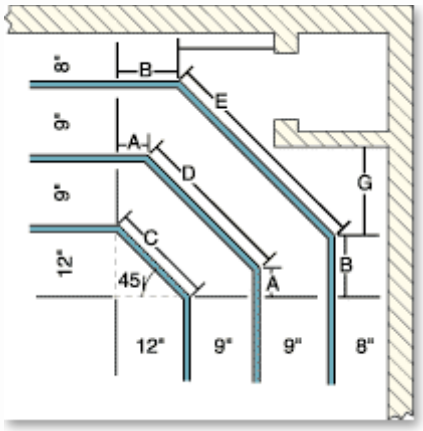
Geometry: Plumber (1)

Micron Technology, Inc.

Job Description: Performs a wide variety of skilled plumbing duties in the construction, maintenance, repair and alteration of facilities.

Problem:

A plumber needs to run three 2-inch lines around the mechanical room. He must offset the pipe around the air handlers in the corners. The outside line is to be 8 inches from the wall and 5 inches from the corner. The spreads between the lines are to be 9 inches and the angle is 45°. Pieces A and B are 3.75 inches and 7.5 inches respectively. What should be the length of pieces C, D, and E?



Geometry: Plumber (1)

Micron Technology, Inc.

Job Description: Performs a wide variety of skilled plumbing duties in the construction, maintenance, repair and alteration of facilities.

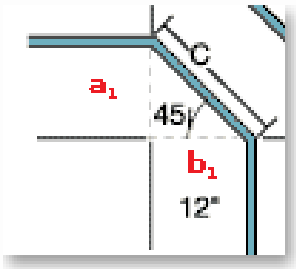
Problem:

A plumber needs to run three 2-inch lines around the mechanical room. He must offset the pipe around the air handlers in the corners. The outside line is to be 8 inches from the wall and 5 inches from the corner. The spreads between the lines are to be 9 inches and the angle is 45°. Pieces A and B are 3.75 inches and 7.5 inches respectively. What should be the length of pieces C, D, and E?

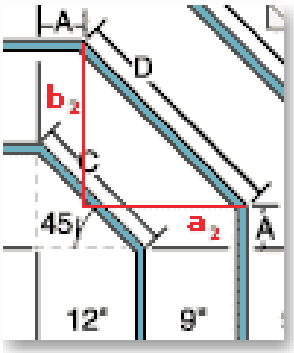
Solution:

Use Pythagorean Theory: $a^2 + b^2 = c^2$
Special case for 45° right triangles:
Since a=b, equation becomes $2a^2 = c^2$

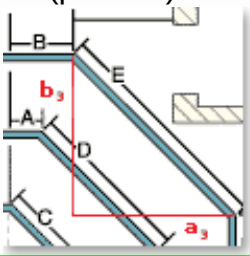
Length C:
side $a_1 = b_1 = 12 + 2 = 14"$
$2a^2 = c^2$
$2 \times 14^2 = C^2$
$2 \times 19^6 = C^2$
$392 = C^2$
$\sqrt{392}$= **19.8"** = Length C



Length D:
side $a_2 = 9 + 2 + 12 + 2 - 3.75$ (piece A) = 21.25""
$2a^2 = D^2$
$2 \times 21.25^2 = D^2$
$2 \times 451.5 = D^2$
$903 = D^2$
$\sqrt{903.125}$= **30.05"** = Length D



Length E:
side $a_3 = 9 + 2 + 9 + 2 + 12 + 2 - 7.5$ (piece B) = 28.5"
$2a^2 = E^2$
$2 \times 28.5^2 = E^2$
$2 \times 812.25 = E^2$
$1624.5 = E^2$
$\sqrt{1624.5}$ = **40.31"** = Side E



Geometry: Plumber (2)

Micron Technology, Inc.

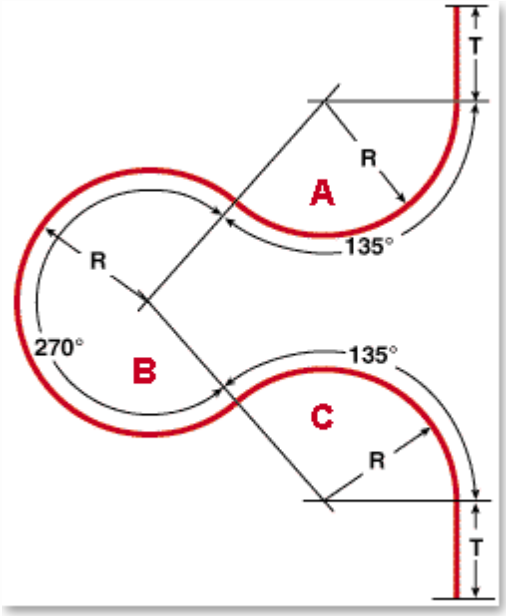
Job Description: Performs a wide variety of skilled plumbing duties in the construction, maintenance, repair and alteration of facilities.

Problem:

The pipe fitters have to be able to calculate the length of pipe needed, including the lengths for corners and bends.

What is the length of pipe for the expansion bend shown in the illustration which has a radius (R) of 24 inches, two 10 inch tangents (T), and distance in degrees (D) as shown.

Total $L = L_A + L_B + L_C + 2L_T$



Geometry: Plumber (2)

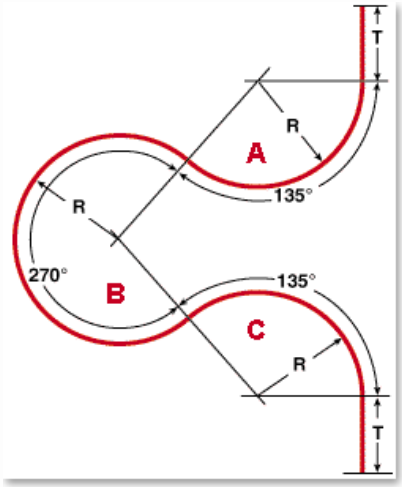
Micron Technology, Inc.

Job Description: Performs a wide variety of skilled plumbing duties in the construction, maintenance, repair and alteration of facilities.

Problem:

The pipe fitters have to be able to calculate the length of pipe needed, including the lengths for corners and bends.

What is the length of pipe for the expansion bend shown in the illustration which has a radius (R) of 24 inches, two 10 inch tangents (T), and distance in degrees (D) as shown.



Total $L = L_A + L_B + L_C + 2L_T$

Solution:

Length of the bend:

$L = 2 \pi R \cdot D \div 360$ (R=radius, D=distance in degrees)

$L_A = 2 \pi 24 \cdot 135 \div 360 = 56.538"$

$L_B = 2 \pi 24 \cdot 270 \div 360 = 113.076"$

$L_C = 2 \pi 24 \cdot 135 \div 360 = 56.538"$

56.538 (A) + 113.076 (B) + 56.538 (C) = 226.152 inches

Length of the pipe:

L + 2T = 226.152 + 20 = 246.152 inches