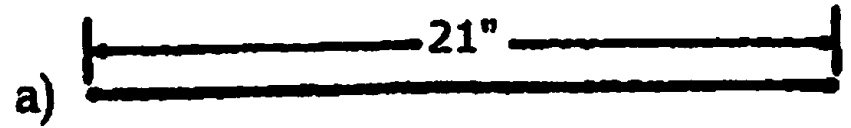




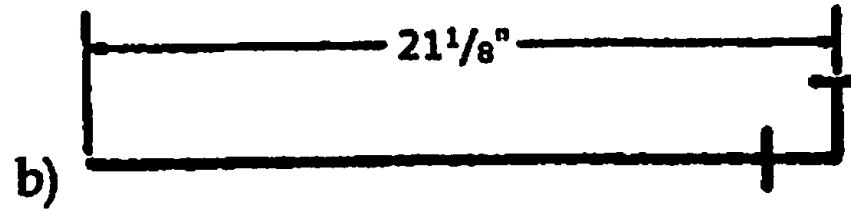
Building Trades

Reviewing the Basic Skills
and Knowledge

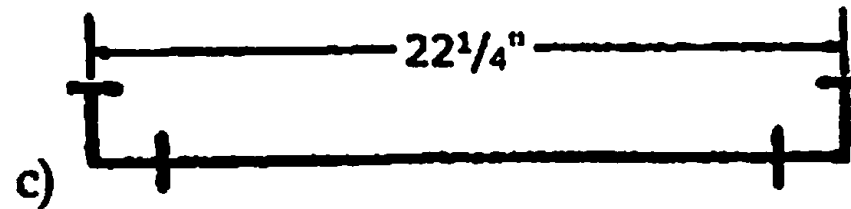
Examples of Measurements



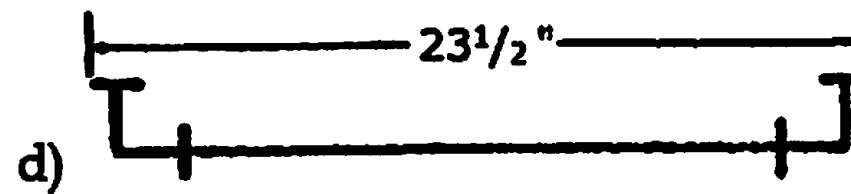
a) _____ 21 inches End to End



b) _____ 21 and 1/8 End to Center



c) _____ 22 and 1/4 Center to Center



d) _____ 23 and 1/2 Outside to Outside

Adding and Subtracting Measurements

(Example of 2' 10 1/2" and 1' 3 1/8")

- Converting feet to inches

Multiply feet by 12 to get total inches

$$2' 10 \frac{1}{2}": (2' * 12 = 24" + 10 \frac{1}{2}" = 34 \frac{1}{2}"): \quad 34 \frac{1}{2}"$$

$$1' 3 \frac{1}{8}": (1' * 12 = 12 + 3 \frac{1}{8}" = 15 \frac{1}{8}"): \quad 15 \frac{1}{8}"$$

- Convert to Decimal

$$\frac{1}{2}" = .5 \rightarrow 34.5$$

$$\frac{1}{8}" = .125 \rightarrow 15.125$$

OR

Similar Fractions

$$\frac{1}{2} \rightarrow \frac{4}{8} \rightarrow 34 \frac{4}{8}$$

$$\frac{1}{8} \rightarrow \frac{1}{8} \rightarrow 15 \frac{1}{8}$$

- Add or Subtract converted numbers

$$34.5 + 15.125 = 49.625 \quad \text{OR}$$

$$34.5 - 15.125 = 19.375 \quad \text{OR}$$

$$34 \frac{4}{8} + 15 \frac{1}{8} = 49 \frac{5}{8}$$

$$34 \frac{4}{8} - 15 \frac{1}{8} = 19 \frac{3}{8}$$

Using PI (≈ 3.14159)

(Example 12 inch Nominal Pipe Size[12" I.D. and 12.75 O.D.]

- Using PI to find Circumference:

$\pi * \text{Diameter of the pipe} = \text{Circumference}$

uses outside diameter

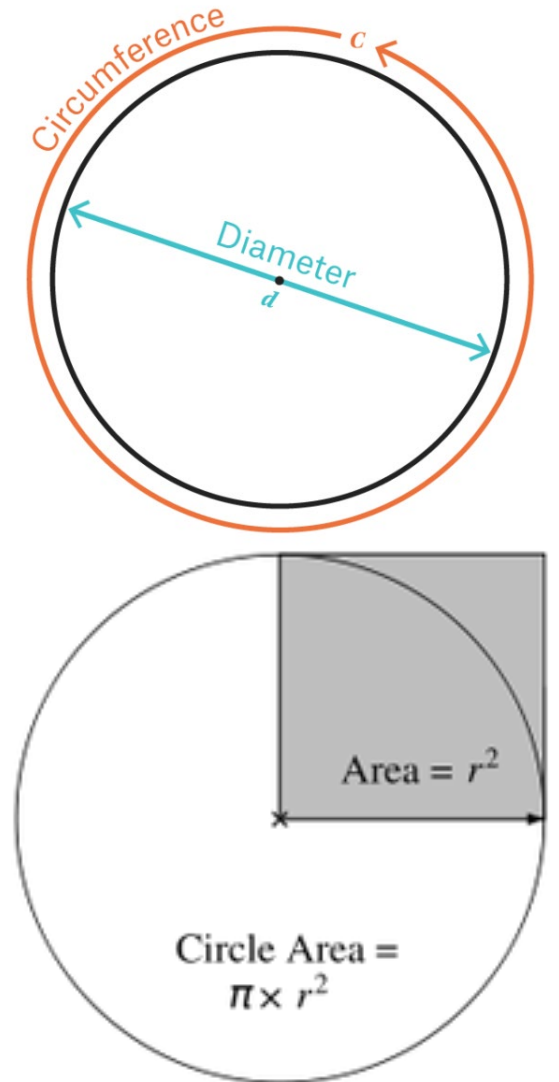
$3.14159 * 12.75 \approx 40.055 \rightarrow 40 \frac{1}{16}"$

- Using PI to find Area:

$\pi * r^2$

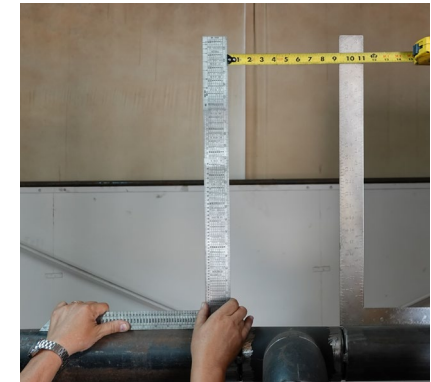
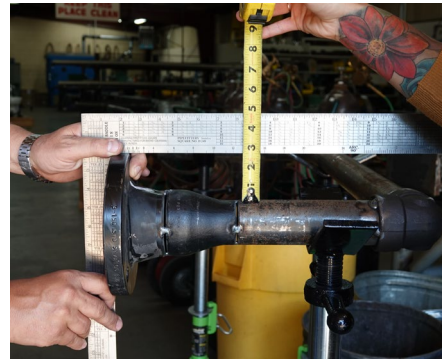
Uses inside Diameter($d/2 = \text{radius}$)($r = 12/2 = 6$)

$3.14159 * 6^2 \rightarrow 3.14159 * 36 \approx 113.097 \rightarrow 113 \frac{3}{32} \text{ sqin}$



Square each Piece

- Using a Square tool to ensure flange faces, elbows and Rise/Run pieces are square to each other
- May need to use a Tape to ensure distance is the same along the run of pipe.
- While its useful to level pieces together, squaring provides more accurate results.



Two Hole

- Ensure each flange is oriented correctly
- Use a level to make sure the top two holes are level with all Runs.



Take-offs

- Blue Book has multiple sizes and fittings listed
- Rule of Thumb:
 - 90° Multiply size by 1.5(6" example: divide by 2 -> 6 : 3 = 9"(add both numbers)
 - 45° Multiply size by .625(6" example: divide by 2(3x's) -> 6 : 3 : 1.5 : .75(add 2nd and 4th numbers)
- External Videos demonstrating these concepts:



<https://youtu.be/X5fE2-rwHbE>



<https://youtu.be/hxH55y8DwRQ>