



# Industrial Technology Virtual Learning

**CTE**

**May 4<sup>th</sup>, 2020**



# Machine Technology 1

## Measuring a Bolt 1

May 4<sup>th</sup>, 2020

Objective: Students will properly measure a bolt and be able to identify different grades of bolts, both standard and metric.

# Identifying Metric from Standard

## Size and Pitch



## Head Markings



# BOLT SIZE

• Diameter x Thread Pitch x Length

# SAE Bolt Size

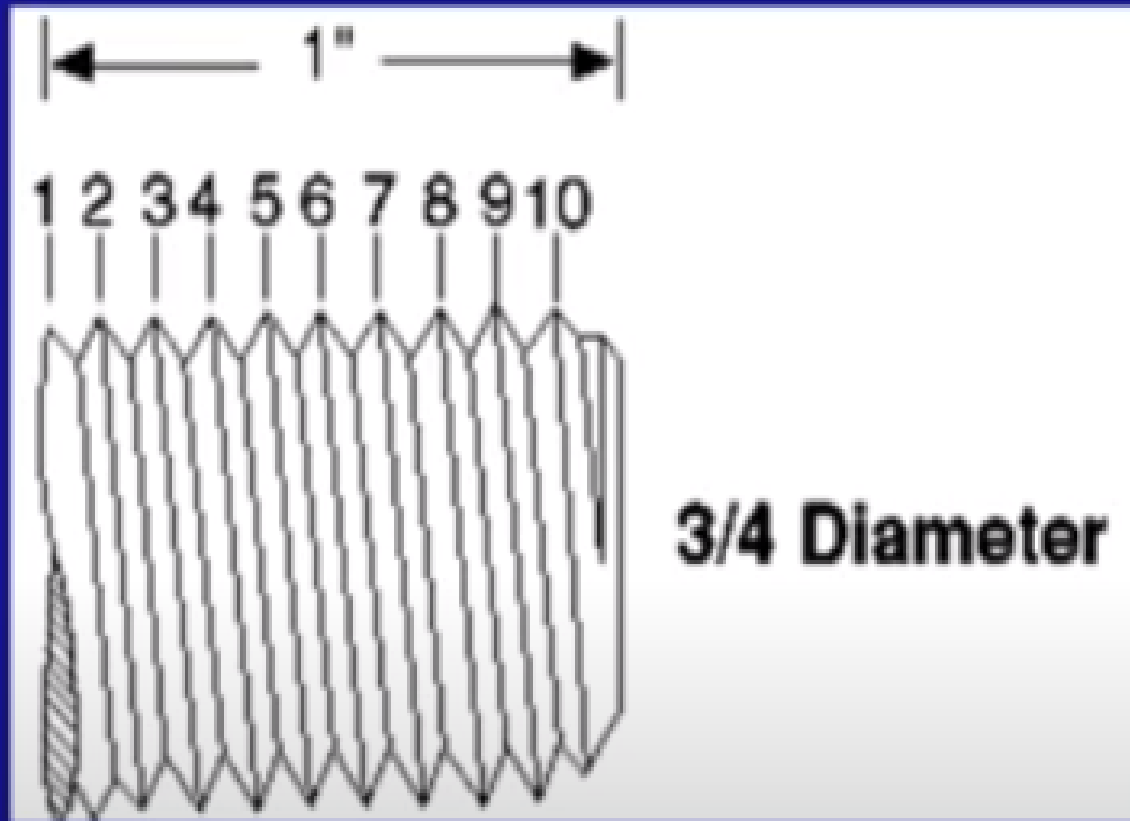


- Aka Standard Bolt
- Diameter
- Thread Pitch (threads per inch)
- Length

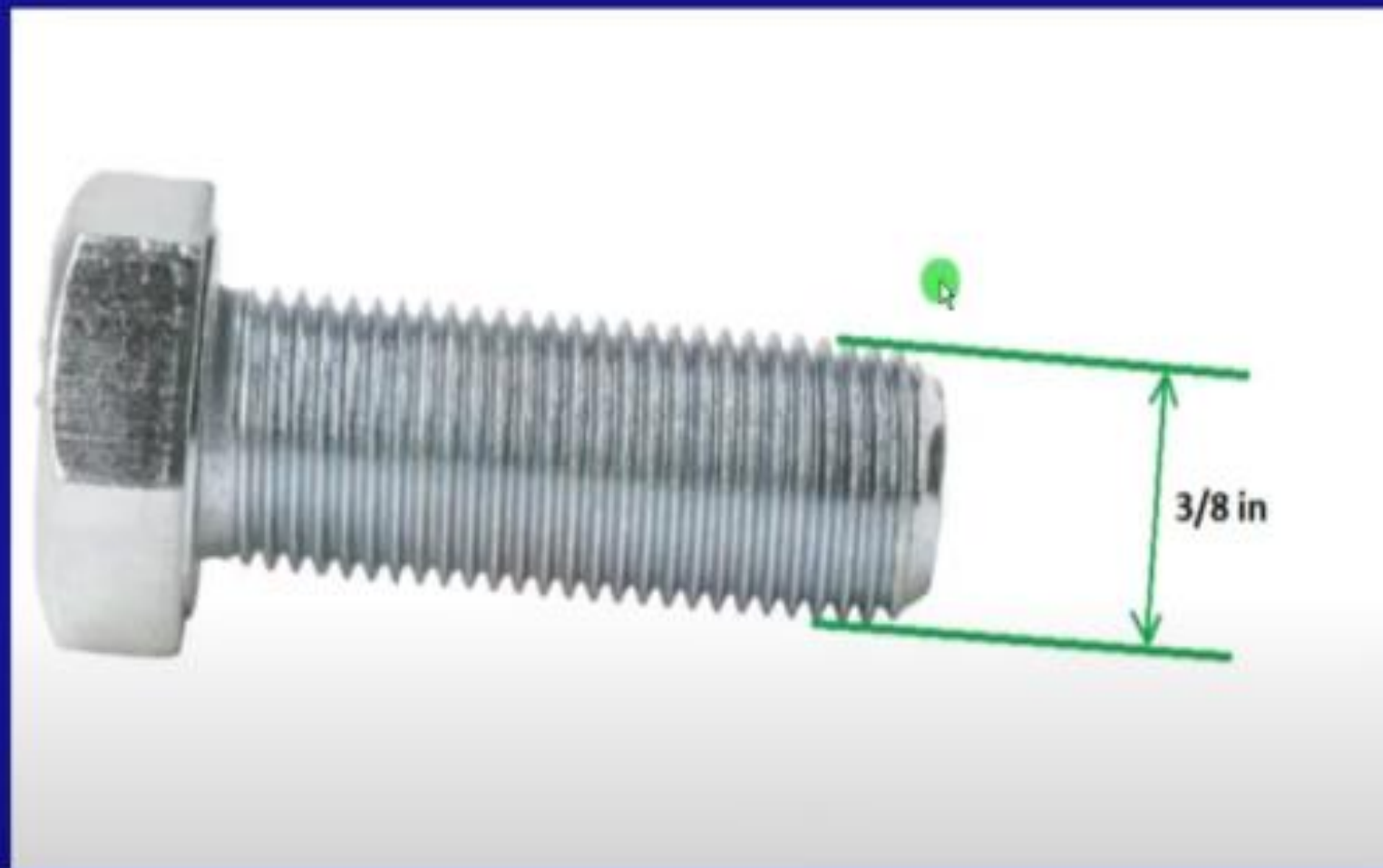
Written as :

Diameter x Pitch x Length

Example:  $1/4 \times 20 \times 2 \frac{1}{2}$

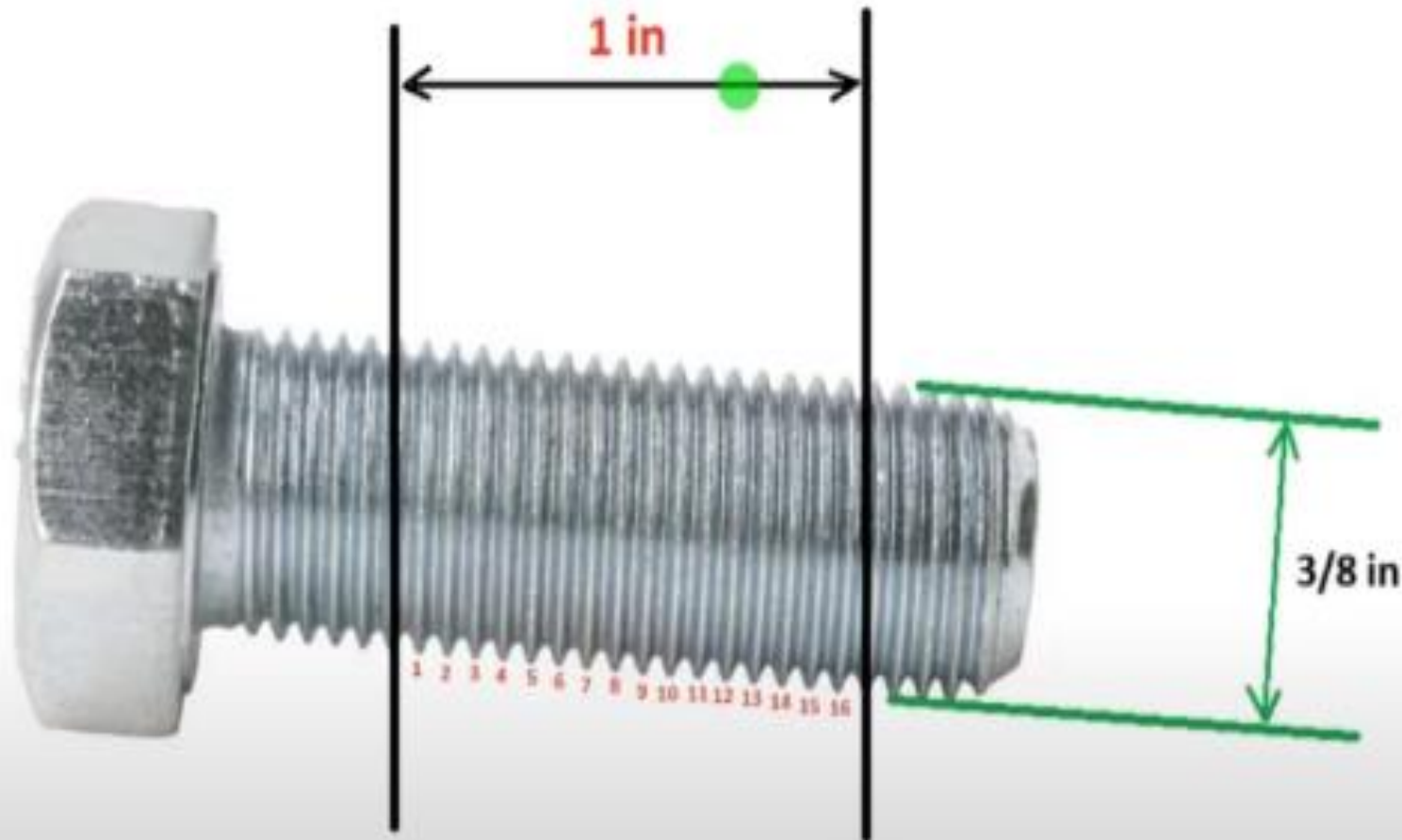


## Diameter



- Outside measurement of thread width.
- **NOT** the size of the wrench head.

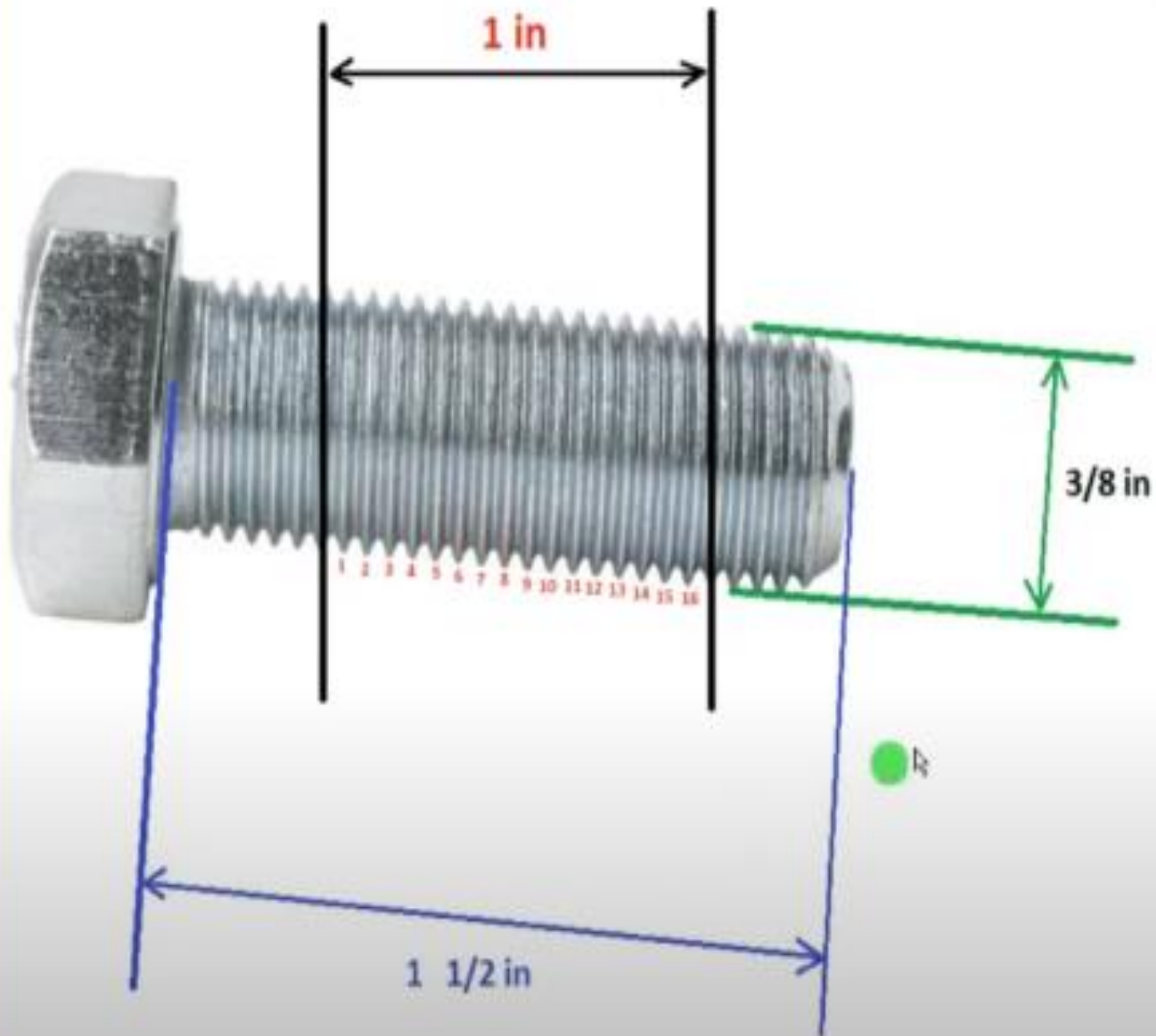
# STANDARD



## Thread Pitch

- TPI (threads per inch)
- Number of threads found in each inch of length.
- NC National Course
- NF National Fine
- BPT Pipe Thread

# Length



- How long the bolt is.
- DOES NOT count the head.



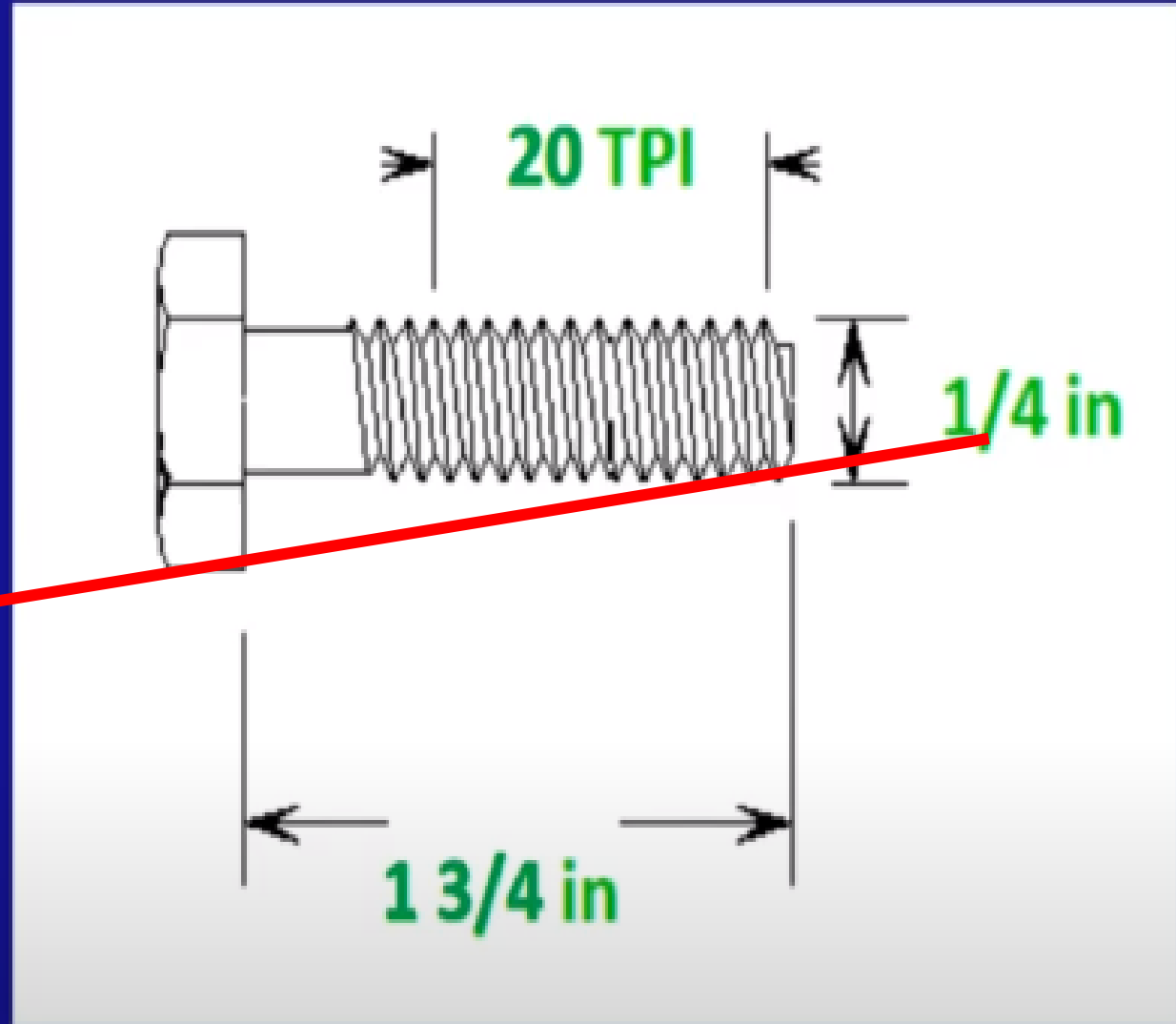
# Standard Bolt Size

- Diameter
- Pitch
- Length
- Dia. x TPI x Length

$1/4$

x

x

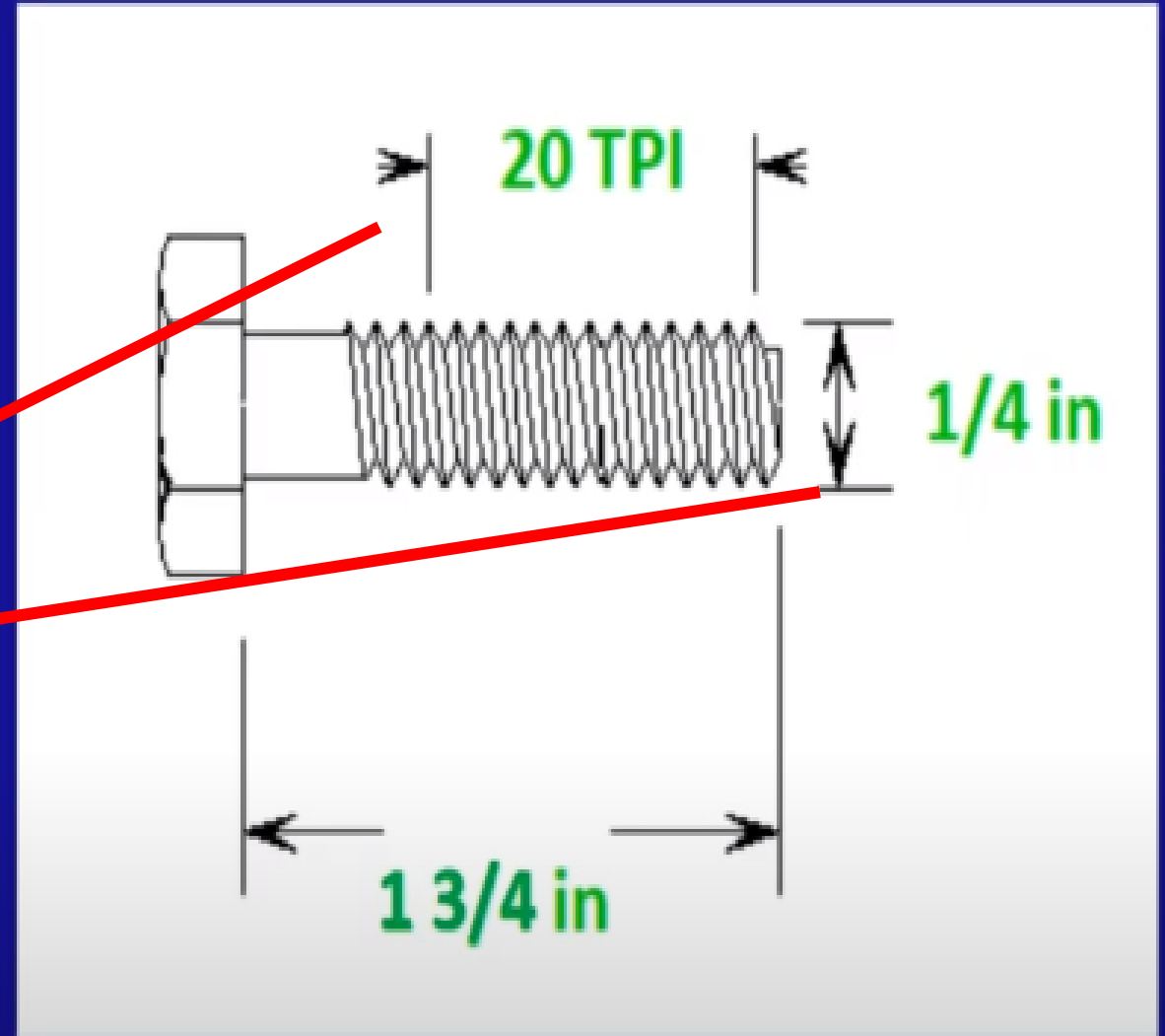


# Standard Bolt Size

- Diameter
- Pitch
- Length
- Dia. x TPI x Length

$\frac{1}{4}$  x 20

●

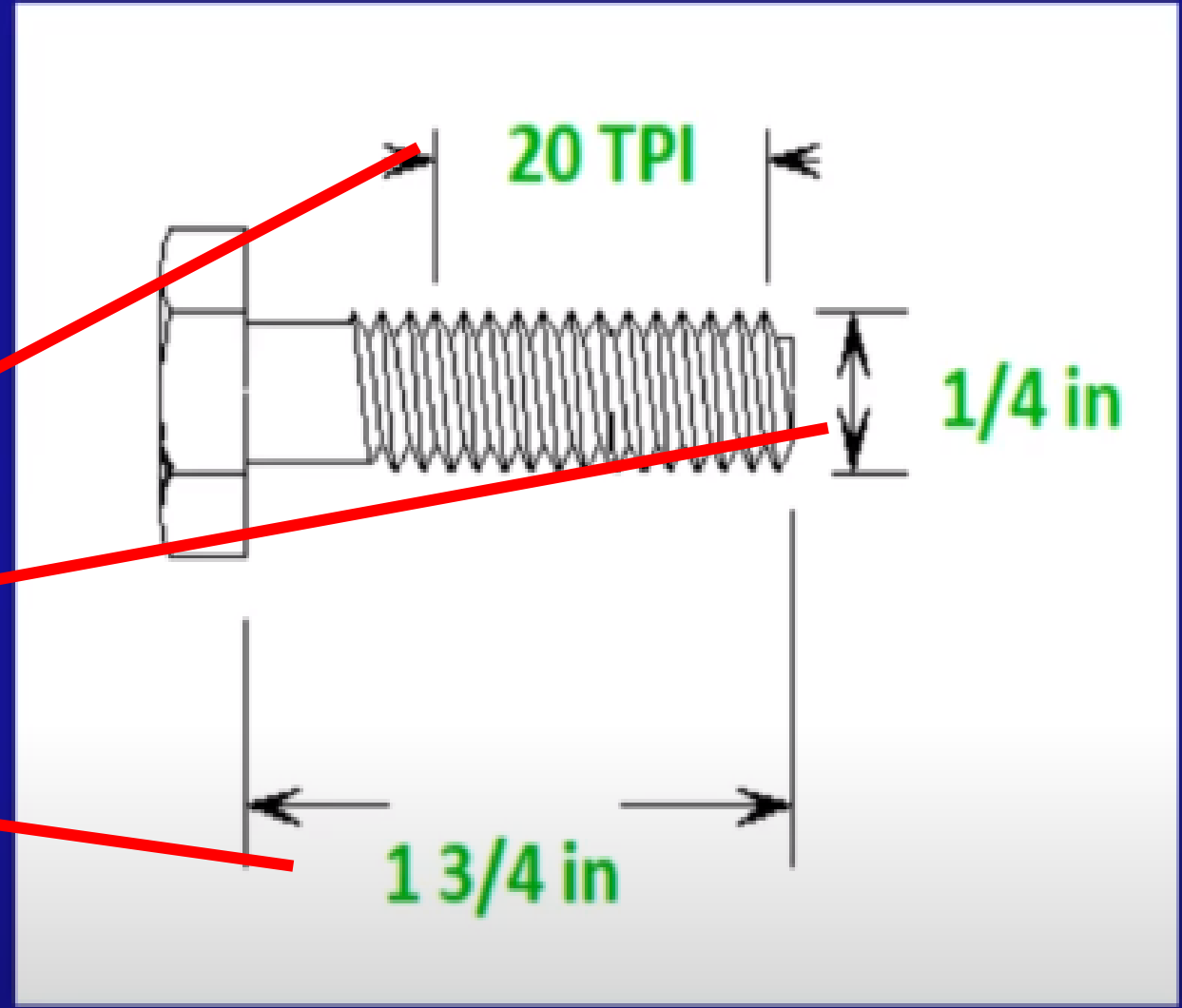


# Standard Bolt Size

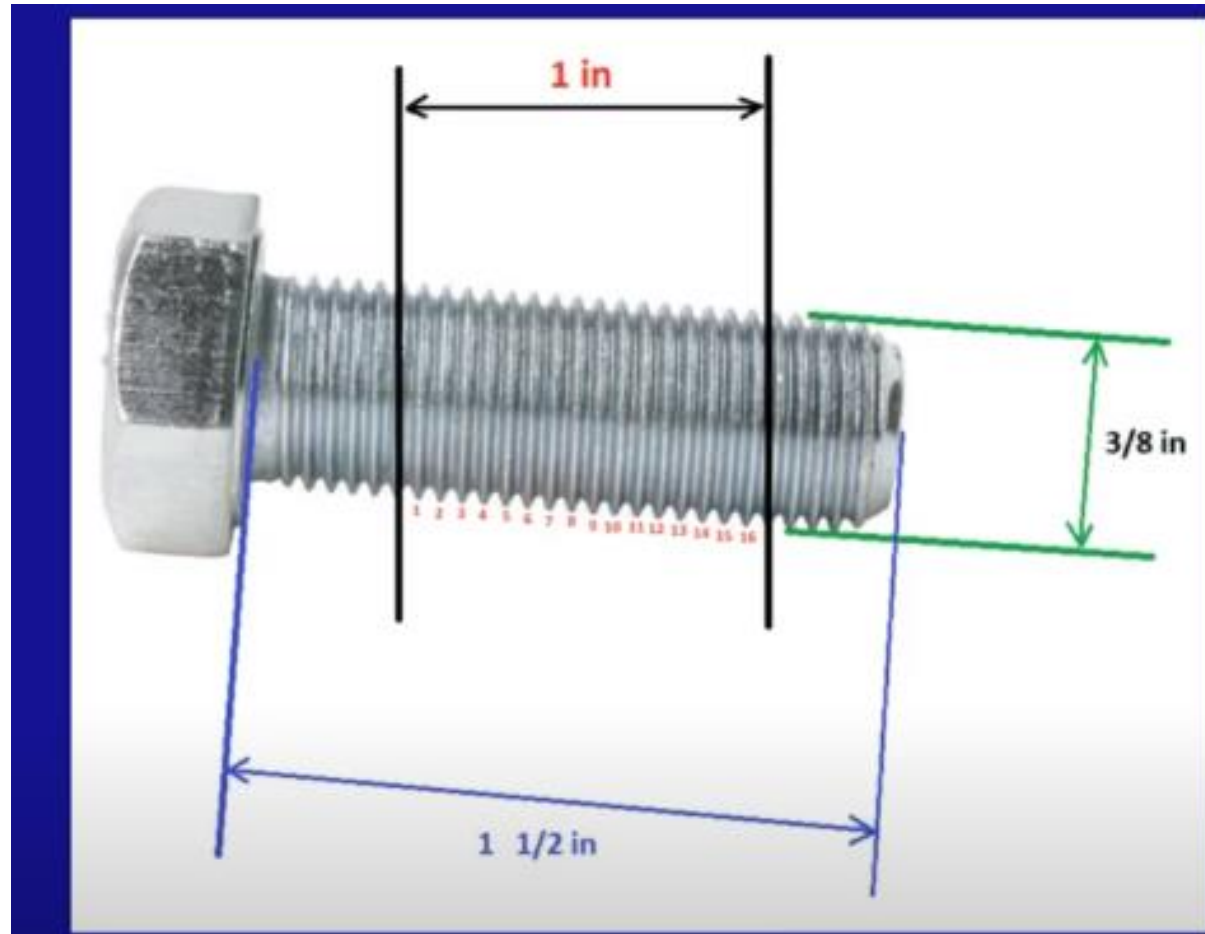
- Diameter
- Pitch
- Length
- Dia. x TPI x Length

$$\frac{1/4}{\text{---}} \times \frac{20}{\text{---}} \times \frac{1\ 3/4}{\text{---}}$$

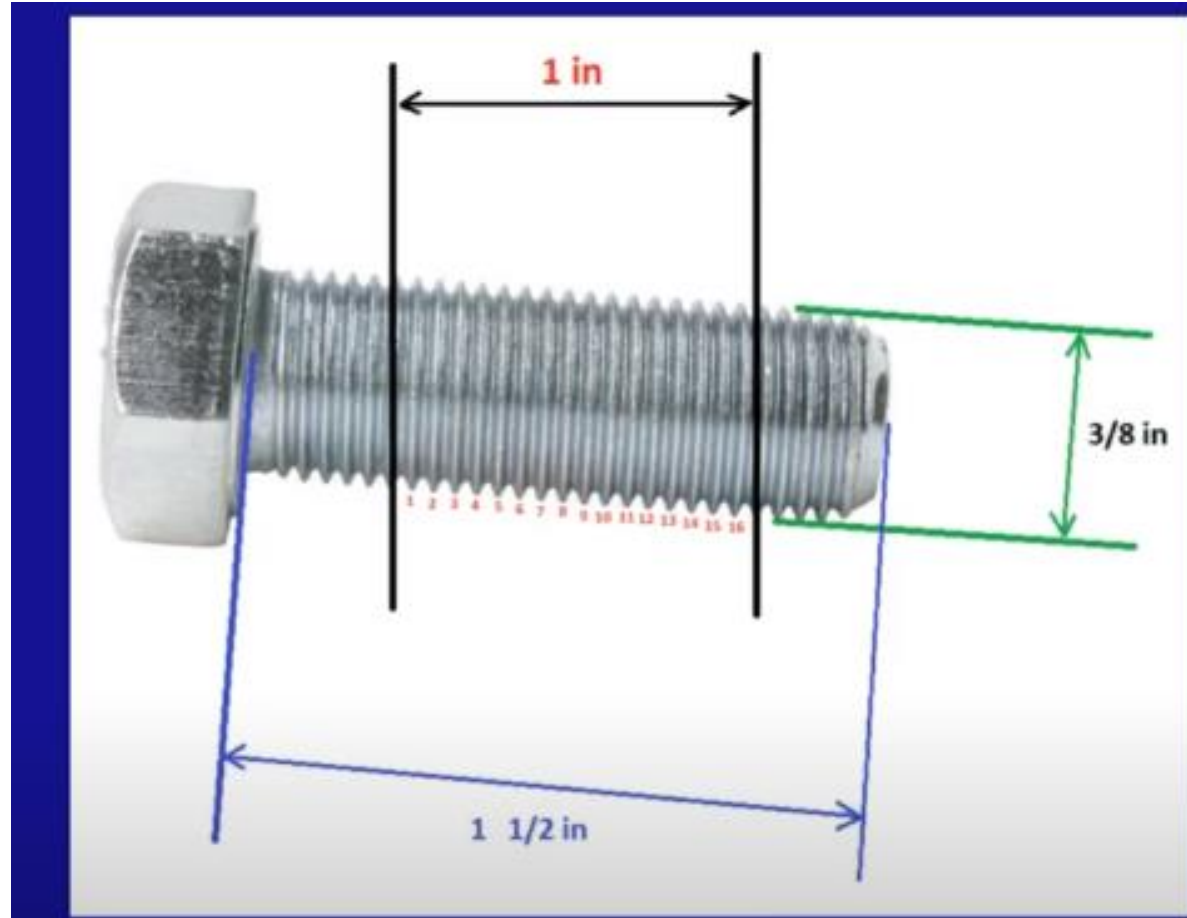
●



What size is this bolt?

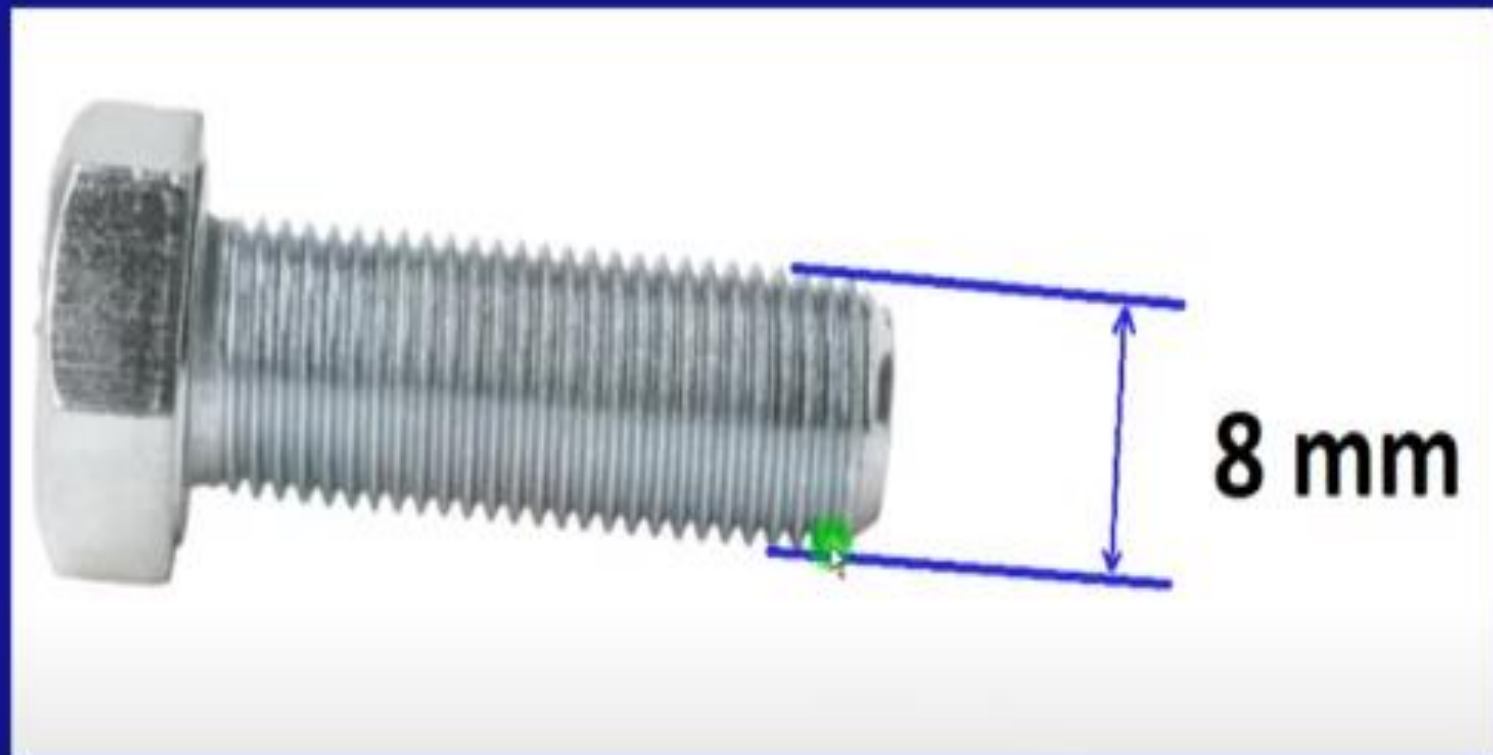


Remember it's Dia x TPI x length



$3/8 \times 16 \times 1 \frac{1}{2}$

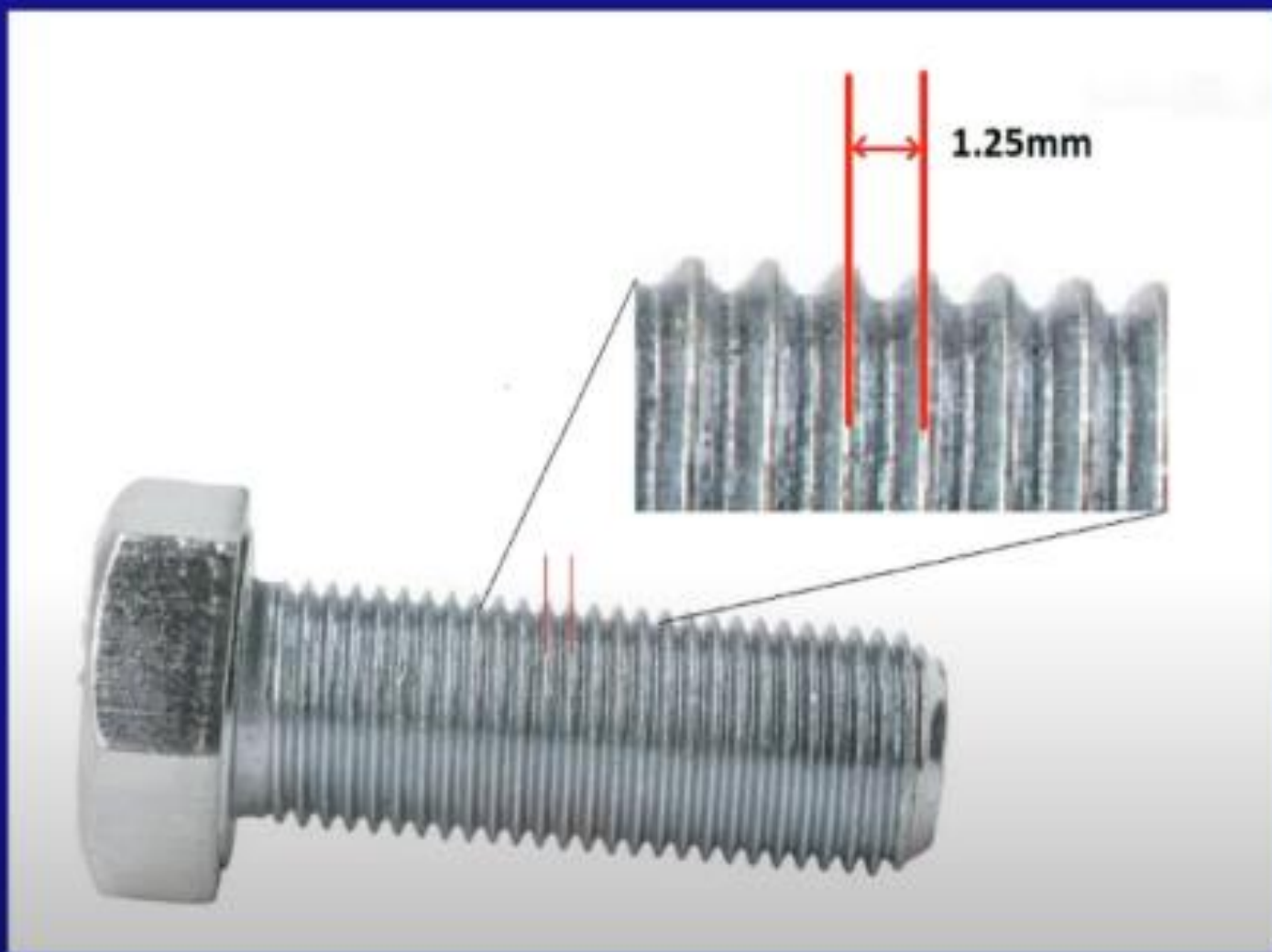
# METRIC



## Diameter (Metric)

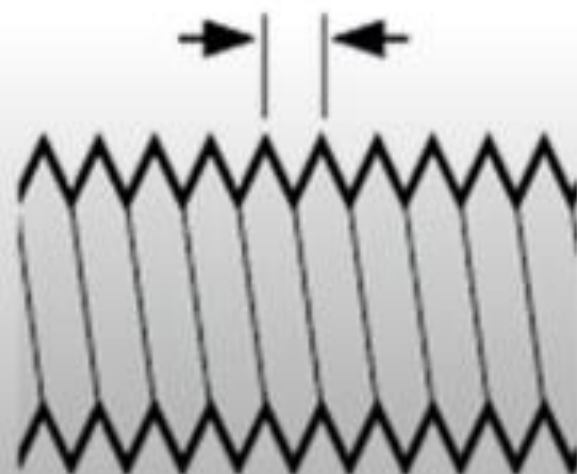
- Distance between outside of threads.
- Measured in millimeters.

# METRIC



## Thread Pitch (Metric)

- Distance between threads.
- Measured in millimeters.



Metric Thread Pitch

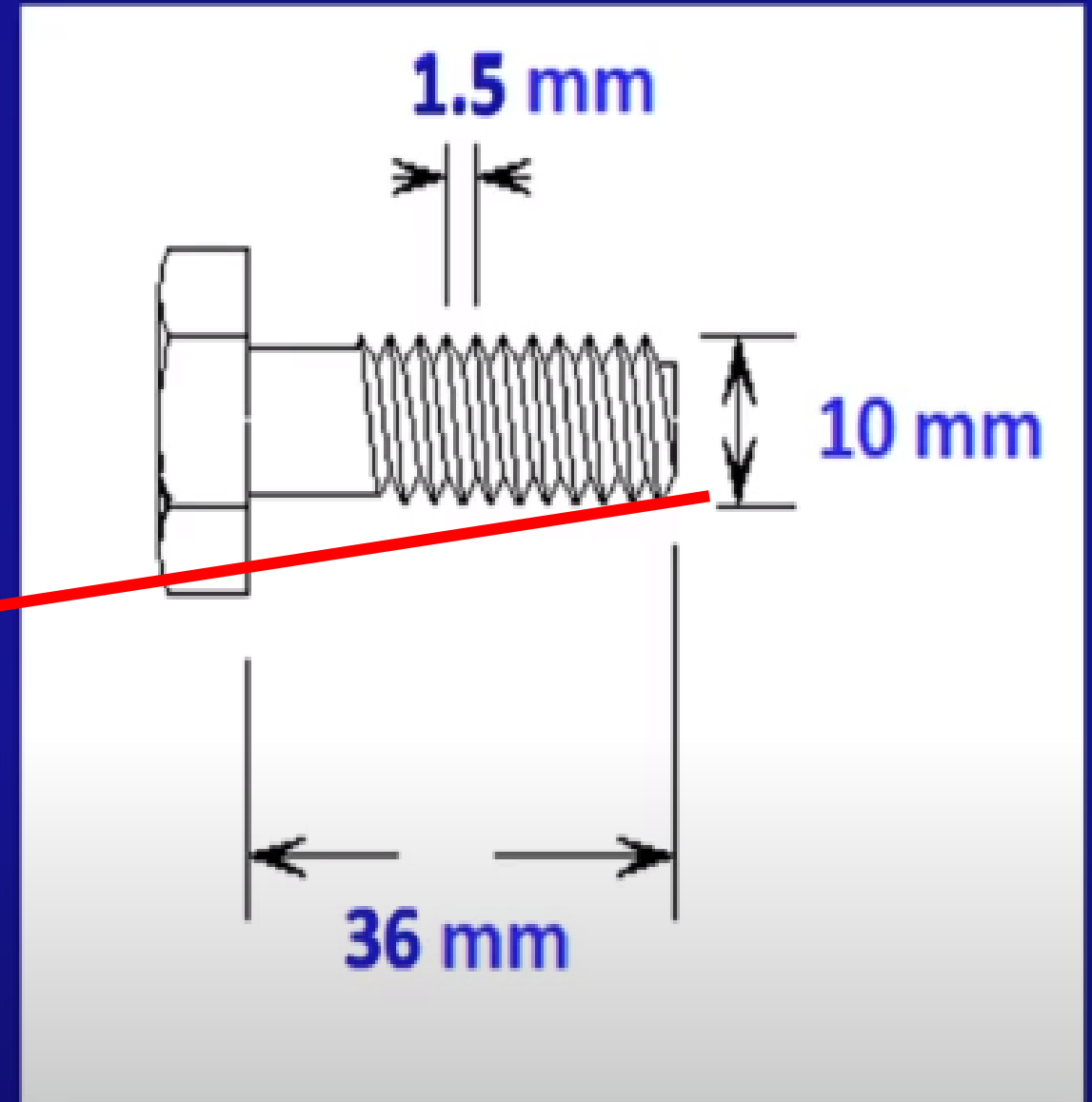
# Metric Bolt Size

- Diameter
- Pitch
- Length
- Dia. x Pitch x Length

10

x

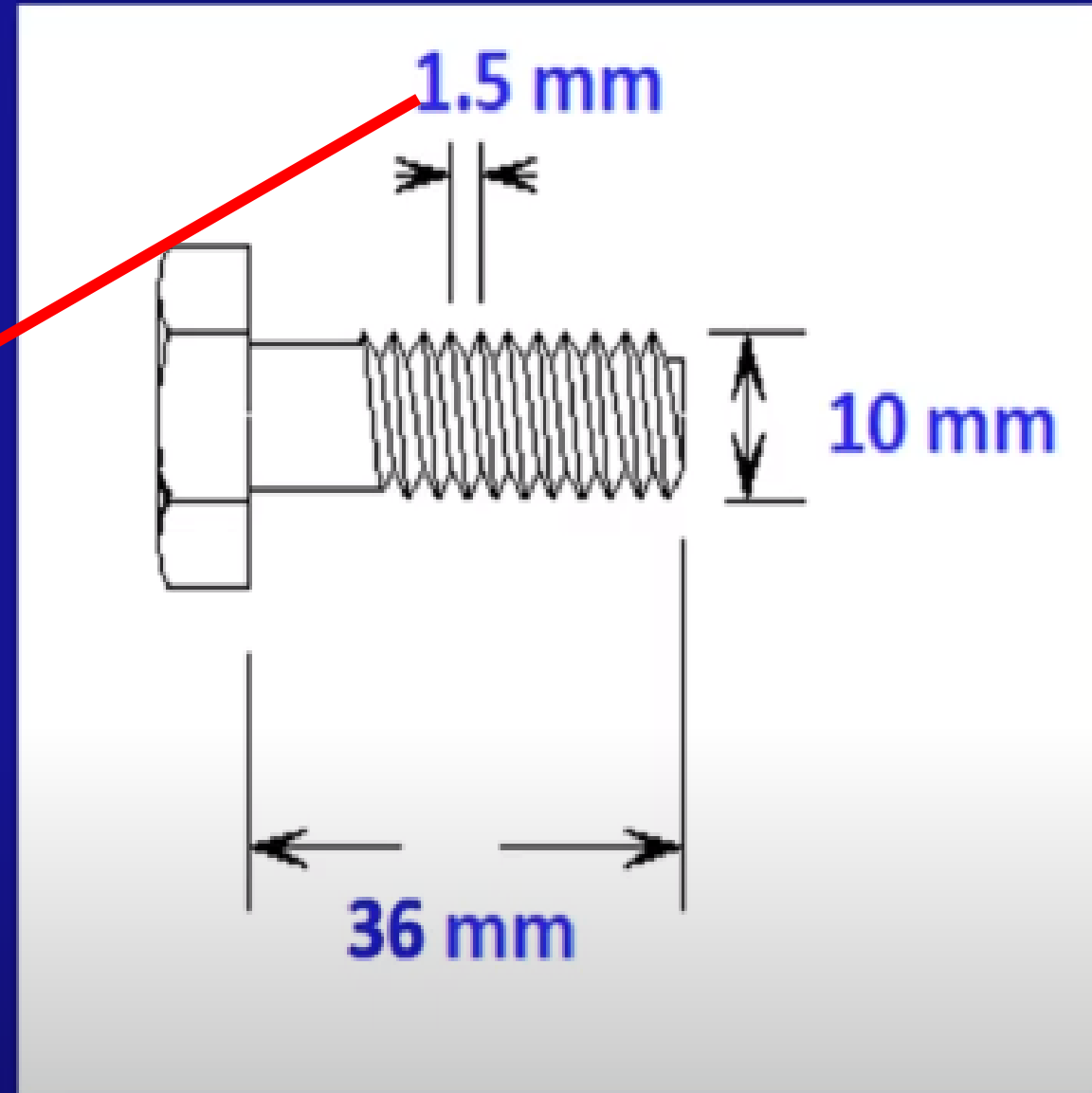
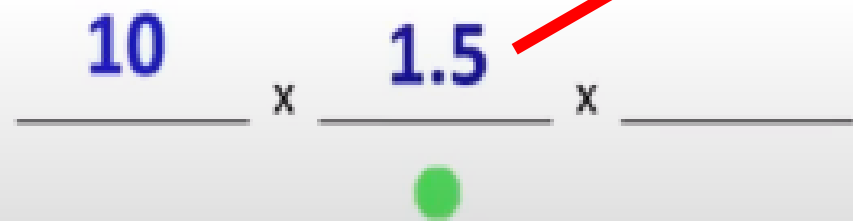
x





# Metric Bolt Size

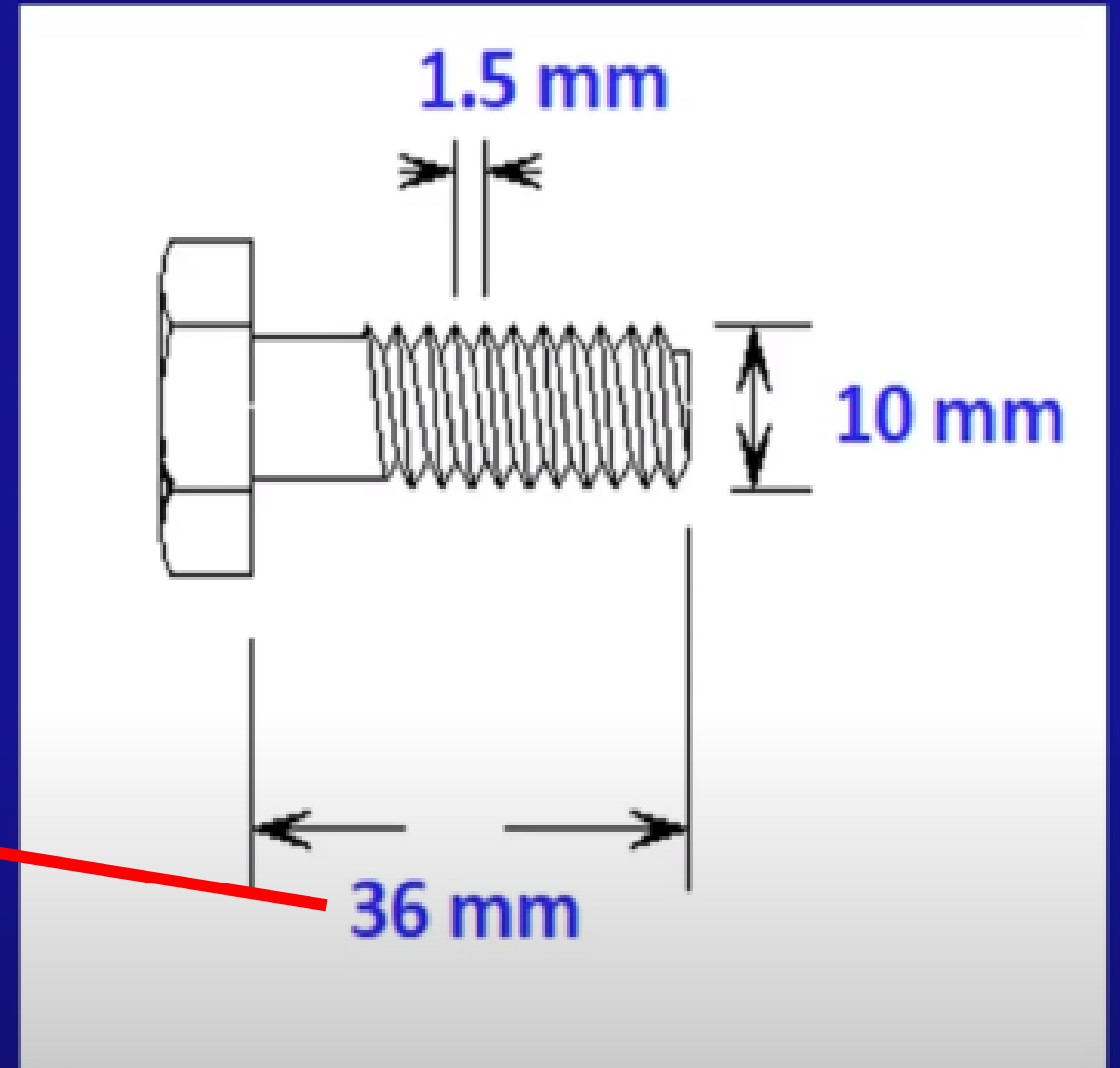
- Diameter
- Pitch
- Length
- Dia. x Pitch x Length



# Metric Bolt Size

- Diameter
- Pitch
- Length
- Dia. x Pitch x Length

10 x 1.5 x 36



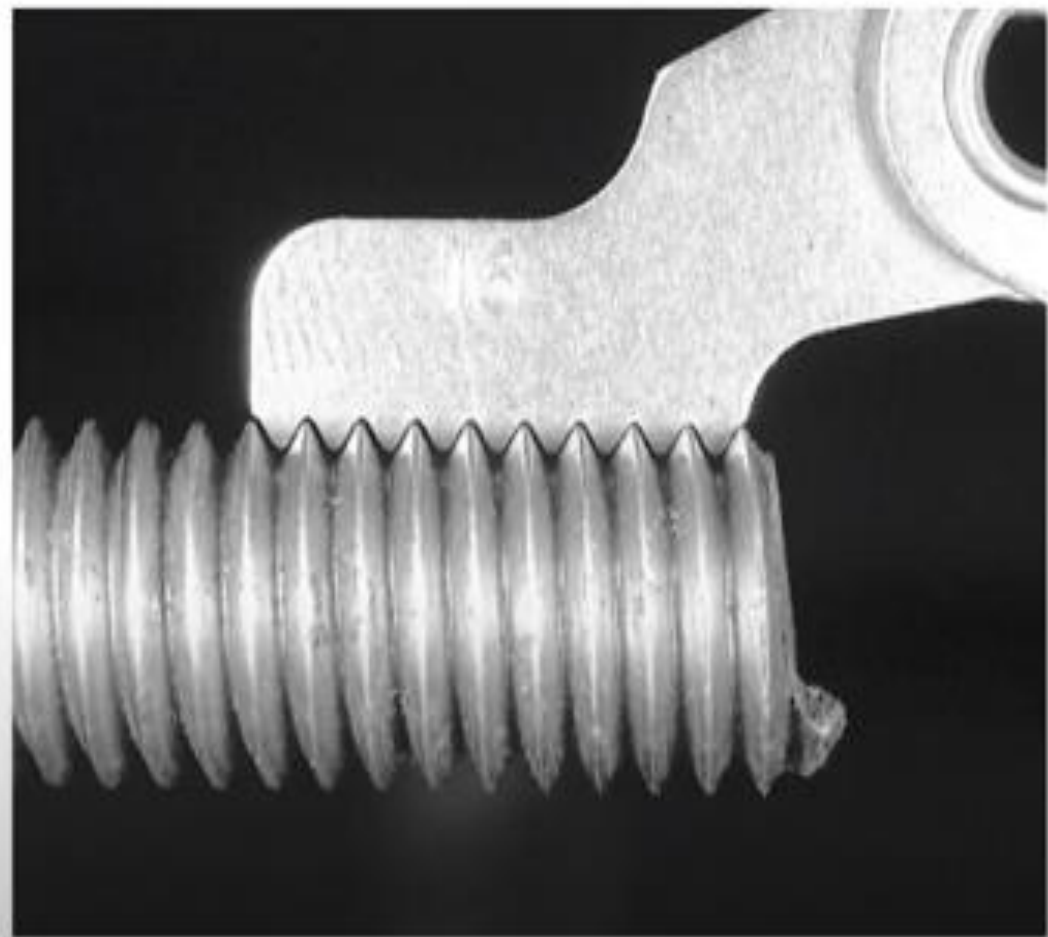
# Thread Pitch Gauge

- Sample thread pitches
- Metric and Standard sizes





# Using the Gauge



# Carefull

- Some Metric and Standard pitches are really close.
- Hold it up to the light to make sure.

