

IDENTIFICATION

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BACKGROUND

Title: I am hard-headed! Now how hard is my head? Background: Hardness of materials is one of the most used material selection factors. Hardness is equated with wear resistance and durability. One of the hardness tests is called the Brinell hardness test. In this case, a ball is pushed into the surface of the material, and an optical measuring device is used to measure the diameter of the resulting indentation. The diameter of the ball and indentation, and the applied force is then used calculate the Brinell hardness number (HB).

$$HB = L / \{ (\pi * D / 2) (D - \sqrt{D^2 - d^2}) \}$$

where L = load, kg D = diameter of indenter, mm d = diameter of indentation, mm

SPECIFICATIONS

Specifications: Write a Matlab Worksheet where the values of L, D, and d, are written in the beginning of the matlab worksheet and then computes and displays the Brinell Hardness.

INPUTS and DISPLAYING INPUTS

```
clc
L = 3000;
D = 10;
d = 7.2;
fprintf('\nThe Load Applied in kgf is L=%d',L)
fprintf('\nThe Diameter of the Indented Load in mm is D=%d',D)
fprintf('\nThe Diameter of the Indent in mm is L=%d',d)
```

```
The Load Applied in kgf is L=3000
The Diameter of the Indented Load in mm is D=10
The Diameter of the Indent in mm is L=7.200000e+000
```

CODE

```
%Calculating the hardness using the formula
HB=L/((pi*D/2)*(D-sqrt(D^2-d^2)));
```

DISPLAYING OUPUTS

```
fprintf('\nThe Hardness of the Material is HB=%d',HB)
```

```
The Hardness of the Material is HB=6.240841e+001
```

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