The GUESS Method

Auburn Mountainview: Physics

Karl Steffin, 2022

7/29/2026

The GUESS Method is a way to organize analytical physics situations. It will be expected to use this method on tests and homework sets.

Draw Situation

Equation

Substitute

Solve

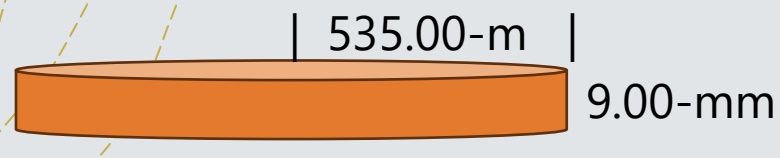
Other work/steps as needed

GIVEN

UNKNOWN

Final Answer

The ice on a lake is 9.00-mm thick. The lake is circular, with a radius of 535.00-m. Find the mass of the ice.



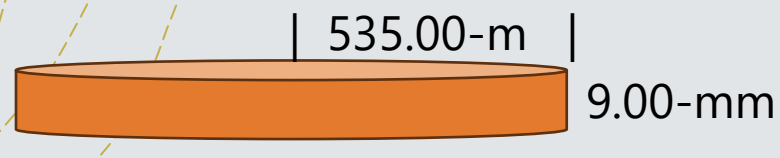
G: Given

$r = 535\text{-m}$

$h = 9 \times 10^{-3}\text{-m}$

$D = 916\text{-kg/m}^3$

The ice on a lake is 9.00-mm thick. The lake is circular, with a radius of 535.00-m. Find the mass of the ice.



U: Unknown

r= 535-m

h= 9×10^{-3}-m

D= 916-kg/m^3

m=

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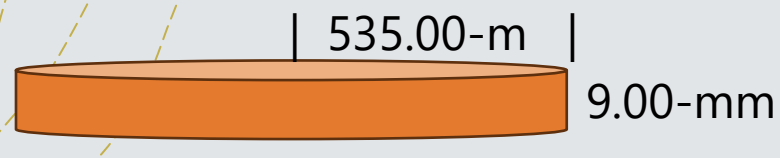

$V_c = \pi r^2 h$

E: Equation

D= m/V

r= 535-m

h= 9×10^{-3}-m

D= 916-kg/m^3

m=

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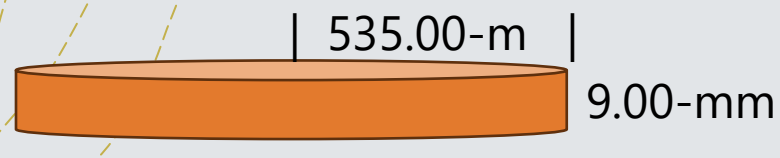

S: Substitute

D= m/V

$V_c = \pi r^2 h$

$V_c = \pi \cdot (535\text{-m})^2 \cdot 9 \times 10^{-3}\text{-m}$

r= 535-m

h= 9×10^{-3}-m

D= 916-kg/m^3

m=

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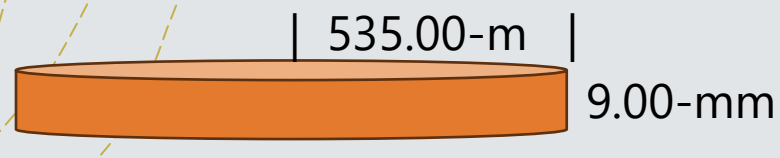

S: Solve

D= m/V

$V_c = \pi r^2 h$

$V_c = \pi \cdot (535\text{-m})^2 \cdot 9 \times 10^{-3}\text{-m}$

$V_c = 8092.821215\text{-m}^3$

r= 535-m

h= 9×10^{-3}-m

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m=

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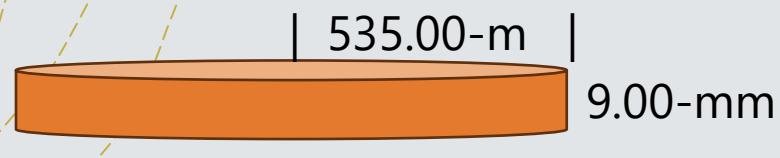

S: Substitute

D= m/V

$$916 - \frac{kg}{m^3} = \frac{m}{8092.82 - m^3}$$

$V_c = \pi r^2 h$

$V_c = \pi \cdot (535\text{-m})^2 \cdot 9 \times 10^{-3}\text{-m}$

$V_c = 8092.821215\text{-m}^3$

r= 535-m

h= 9×10^{-3}-m

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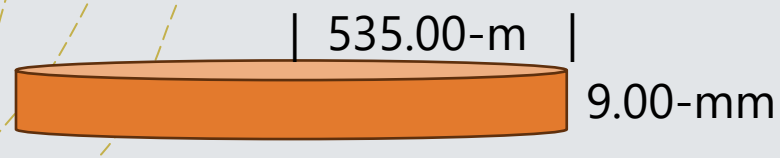

S: Solve

D= m/V

$$916 - \frac{kg}{m^3} = \frac{m}{8092.82 - m^3}$$

$$m = 916 - \frac{kg}{m^3} x\ 8092.82 - m^3$$

$$m = 7413024.233 - kg$$

$V_c = \pi r^2 h$

$V_c = \pi \cdot (535\text{-m})^2 \cdot 9 \times 10^{-3}\text{-m}$

$V_c = 8092.821215\text{-m}^3$

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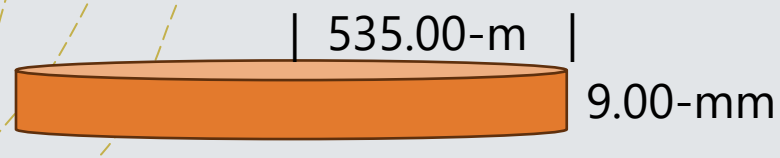

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r= 535-m

h= 9×10^{-3}-m

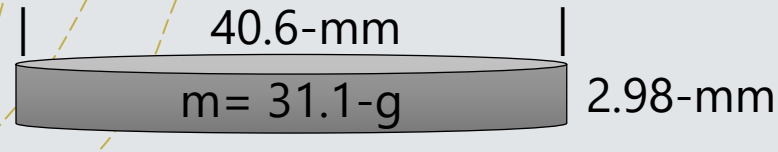
D= 916-kg/m^3

V_c= 8092.82-m^3

m=

7.41×10^6-kg

The $1 American Silver Eagle is almost pure silver. It has a mass of 31.10-g, a diameter of 40.60-mm, and thickness of 2.98-mm. Find the: a) Density b) EA



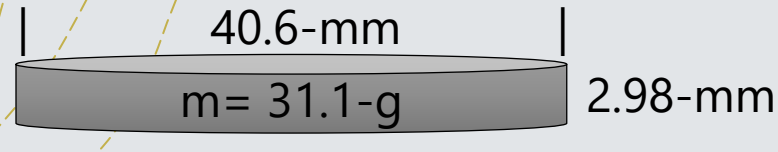
G: Given

$m = 31.1 \times 10^{-3}$-kg

$r = 20.3 \times 10^{-3}$-m

$h = 2.98 \times 10^{-3}$-m

The $1 American Silver Eagle is almost pure silver. It has a mass of 31.10-g, a diameter of 40.60-mm, and thickness of 2.98-mm. Find the: a) Density b) EA



U: Unknown

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D=

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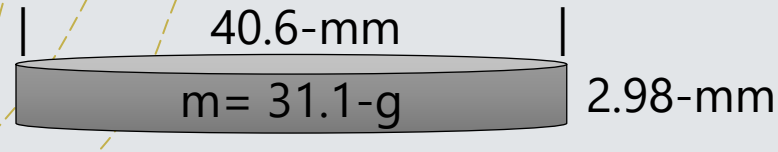

E: Equation

$V_c = \pi r^2 h$

$D = m/V$

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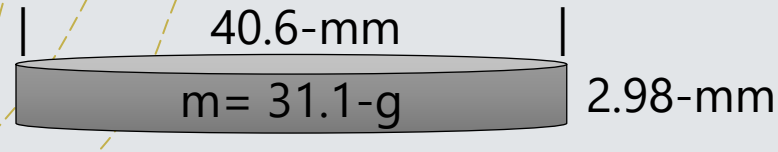

S: Substitute

$D = m/V$

$V_c = \pi r^2 h$

$V_c = \pi \cdot (20.3 \times 10^{-3}\text{-m})^2 \cdot 2.98 \times 10^{-3}\text{-m}$

$m = 31.1 \times 10^{-3}\text{-kg}$

$r = 20.3 \times 10^{-3}\text{-m}$

$h = 2.98 \times 10^{-3}\text{-m}$

$D =$

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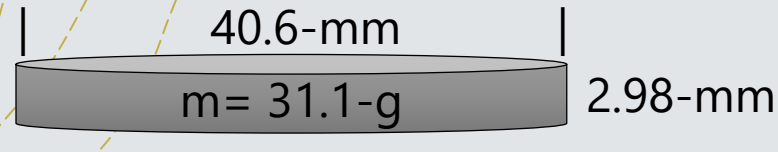


S: Solve

$D = m/V$

$V_c = \pi r^2 h$

$V_c = \pi \cdot (20.3 \times 10^{-3}\text{-m})^2 \cdot 2.98 \times 10^{-3}\text{-m}$

$V_c = 3.85796 \times 10^{-6}\text{-m}^3$

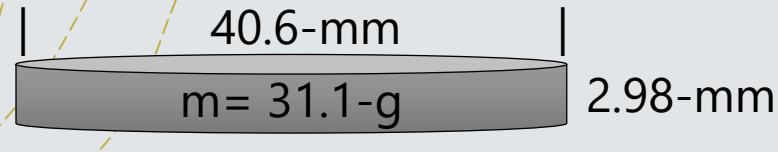
$m = 31.1 \times 10^{-3}\text{-kg}$

$r = 20.3 \times 10^{-3}\text{-m}$

$h = 2.98 \times 10^{-3}\text{-m}$

D=

The $1 American Silver Eagle is almost pure silver. It has a mass of 31.10-g, a diameter of 40.60-mm, and thickness of 2.98-mm. Find the: a) Density b) EA



S: Substitute

D= m/V

$$D = \frac{31.1\ x\ 10^{-3} - kg}{3.85\ x10^{-6} - m^3}$$

$V_c = \pi r^2 h$

$V_c = \pi \cdot (20.3x10^{-3}\text{-m})^2 \cdot 2.98 \times 10^{-3}\text{-m}$

$V_c = 3.85796x10^{-6}\text{-m}^3$

m= 31.1 x 10^{-3}-kg

r= 20.3 x 10^{-3}-m

h= 2.98 x 10^{-3}-m

V_c= 3.85 x 10^{-6}-m^3

D=

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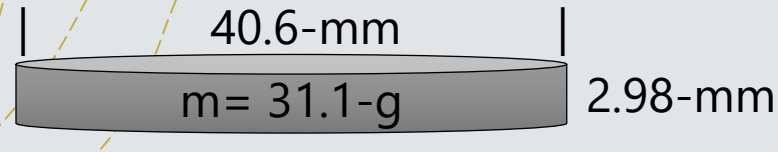

S: Solve

D= m/V

$$D = \frac{31.1\ x\ 10^{-3} - kg}{3.85\ x10^{-6} - m^3}$$

$$D = 8061.246037 - \frac{kg}{m^3}$$

$V_c = \pi r^2 h$

$V_c = \pi \cdot (20.3x10^{-3}\text{-m})^2 \cdot 2.98 \times 10^{-3}\text{-m}$

$V_c = 3.85796x10^{-6}\text{-m}^3$

m= 31.1 x 10^{-3}-kg

r= 20.3 x 10^{-3}-m

h= 2.98 x 10^{-3}-m

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D=

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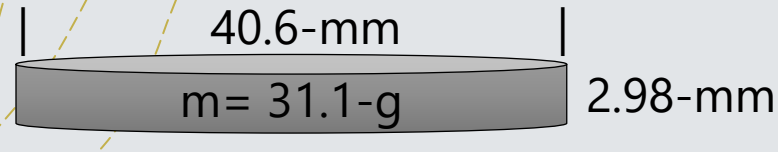

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$V_c = 3.85796x10^{-6}\text{-m}^3$

m= 31.1 x 10^{-3}-kg

r= 20.3 x 10^{-3}-m

h= 2.98 x 10^{-3}-m

V_c= 3.85 x 10^{-6}-m^3

D=

a) 8060-kg/m^3

The $1 American Silver Eagle is almost pure silver. It has a mass of 31.10-g, a diameter of 40.60-mm, and thickness of 2.98-mm. Find the: a) Density b) EA

Picture not needed for b)

G: Given

$D_{meas} = 8061.25\text{-kg/m}^3$

$D_{accept} = 9320\text{-kg/m}^3$

Found online or will be supplied.

The $1 American Silver Eagle is almost pure silver. It has a mass of 31.10-g, a diameter of 40.60-mm, and thickness of 2.98-mm. Find the: a) Density b) EA

Picture not needed for b)

U: Unknown

D_{meas} = 8061.25-kg/m^3

D_{accept} = 9320-kg/m^3

%=

The $1 American Silver Eagle is almost pure silver. It has a mass of 31.10-g, a diameter of 40.60-mm, and thickness of 2.98-mm. Find the: a) Density b) EA

Picture not needed for b)

E: Equation

$$EA = \frac{|D_{meas} - D_{accept}|}{D_{accept}}$$

D_{meas} = 8061.25-kg/m^3

D_{accept} = 9320-kg/m^3

%=

The $1 American Silver Eagle is almost pure silver. It has a mass of 31.10-g, a diameter of 40.60-mm, and thickness of 2.98-mm. Find the: a) Density b) EA

Picture not needed for b)

S: Substitute

$$EA = \frac{|D_{meas} - D_{accept}|}{D_{accept}}$$

$$EA = \frac{|8061.25 - \frac{kg}{m^3} - 9320 - \frac{kg}{m^3}|}{9320 - \frac{kg}{m^3}}$$

D_{meas} = 8061.25-kg/m^3

D_{accept} = 9320-kg/m^3

%=

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Picture not needed for b)

S: Solve

$$EA = \frac{|D_{meas} - D_{accept}|}{D_{accept}}$$

$$EA = \frac{|8061.25 - \frac{kg}{m^3} - 9320 - \frac{kg}{m^3}|}{9320 - \frac{kg}{m^3}}$$

$$EA = 0.135059438$$

$$EA = 13.5059438 - \%$$

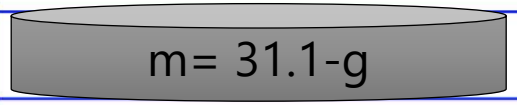
D_{meas} = 8061.25-kg/m^3

D_{accept} = 9320-kg/m^3

%=

EA=13.5-%

9) | 40.6-mm |



2.98-mm

$m = 31.1 \times 10^{-3}\text{-kg}$

$r = 20.3 \times 10^{-3}\text{-m}$

$h = 2.98 \times 10^{-3}\text{-m}$

$V_c = 3.85 \times 10^{-6}\text{-m}^3$

$D =$

a) $D = m/V$

$V_c = \pi r^2 h$

$V_c = \pi \cdot (20.3\text{x}10^{-3}\text{-m})^2 \cdot 2.98 \text{ x } 10^{-3}\text{-m}$

$V_c = 3.85796\text{x}10^{-6}\text{-m}^3$

$$D = \frac{31.1\ x\ 10^{-3} - kg}{3.85\ x\ 10^{-6} - m^3}$$

$$D = 8061.246037 - \frac{kg}{m^3}$$

b) $$EA = \frac{|D_{meas} - D_{accept}|}{D_{accept}}$$

$D_{meas} = 8061.25\text{-kg/m}^3$

$D_{accept} = 9320\text{-kg/m}^3$

%=

$$EA = \frac{|8061.25 - \frac{kg}{m^3} - 9320 - \frac{kg}{m^3}|}{9320 - \frac{kg}{m^3}}$$

$$EA = 0.135059438$$

$$EA = 13.5059438 - \%$$

a) 8060-kg/m^3
b) EA=13.5-%