Golden Balls

Gold facts:

Gold has a density of $\mathbf{19.3\ g/cm^3}$.

The price of gold is currently around ***£35 per gram***.

The entire gold reserves of the world currently total around ***165,000 tonnes***.

Task 1

What is the value of one cubic centimetre of gold?

Task 2a

How heavy would a lump of gold worth £1 million be?

Task 2b

What would the volume of this lump of gold be?

Task 2c

If this lump of gold were made into a sphere, what would its diameter be?

Hint: The volume of a sphere is $V = \frac{4}{3}\pi r^3$. *Remember the diameter is twice the radius.*

Task 3

If the entire gold reserves of the world were melted down to form a huge sphere, what would its diameter be?

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The price of gold is currently around ***£35 per gram***.

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Task 1

What is the value of one cubic centimetre of gold?

$$19.3 \times 35 = \mathbf{£675.50}$$

Task 2a

How heavy would a lump of gold worth £1 million be?

$$1000000 \div 35 = \mathbf{28571}\boldsymbol{g}\ to\ the\ nearest\ gram\ (or\ 28.571kg)$$

Task 2b

What would the volume of this lump of gold be?

$$28571 \div 19.3 = \mathbf{1480}\boldsymbol{cm^3}\ to\ the\ nearest\ cm^3$$

Task 2c

If this lump of gold were made into a sphere, what would its diameter be?

Hint: The volume of a sphere is $V = \frac{4}{3}\pi r^3$. *Remember the diameter is twice the radius.*

$$1480 = \frac{4}{3}\pi r^3 \implies 4440 = 4\pi r^3 \implies 1110 = \pi r^3 \implies 353.3\ldots = r^3$$

$$r = \sqrt[3]{353.3\ldots} = 7.07cm\ to\ 2\ d.p. \quad Diameter = 2 \times 7.07 = \mathbf{14.14}\boldsymbol{cm}\ to\ 2\ d.p.$$

Task 3

If the entire gold reserves of the world were melted down to form a huge sphere, what would its diameter be?

$$165000\ tonnes = 165000000000g$$

$$Volume = 165000000000 \div 19.3 = 8549222798cm^3 = \frac{4}{3}\pi r^3$$

$$r = \sqrt[3]{\frac{3 \times 8549222798}{4\pi}} = 1268.5cm \quad Diameter = 2 \times 1268.5cm = \mathbf{2537}\boldsymbol{cm}\ (25.37m)$$