Topic: Nets/volume/surface area of prisms

Question: Find the surface area of the rectangular box with length $10'$, width $4'$, and height $5'$.

Answer choices:

A $200\ \text{ft}^2$

B $220\ \text{ft}$

C $220\ \text{ft}^2$

D $180\ \text{ft}^2$

Solution: C

The surface area of a rectangular box will be the sum of the areas of its six sides:

Top and bottom	length × width
Left and right	width × height
Front and back	length × height

We'll use the formula

$$A = 2lw + 2wh + 2lh$$

Plugging in the dimensions of the box we've been given, we get

$$A = 2[(10\ \text{ft})(4\ \text{ft})] + 2[(4\ \text{ft})(5\ \text{ft})] + 2[(10\ \text{ft})(5\ \text{ft})]$$

$$A = 2[(40\ \text{ft}^2)] + 2[(20\ \text{ft}^2)] + 2[(50\ \text{ft}^2)]$$

$$A = 80\ \text{ft}^2 + 40\ \text{ft}^2 + 100\ \text{ft}^2$$

$$A = 220\ \text{ft}^2$$

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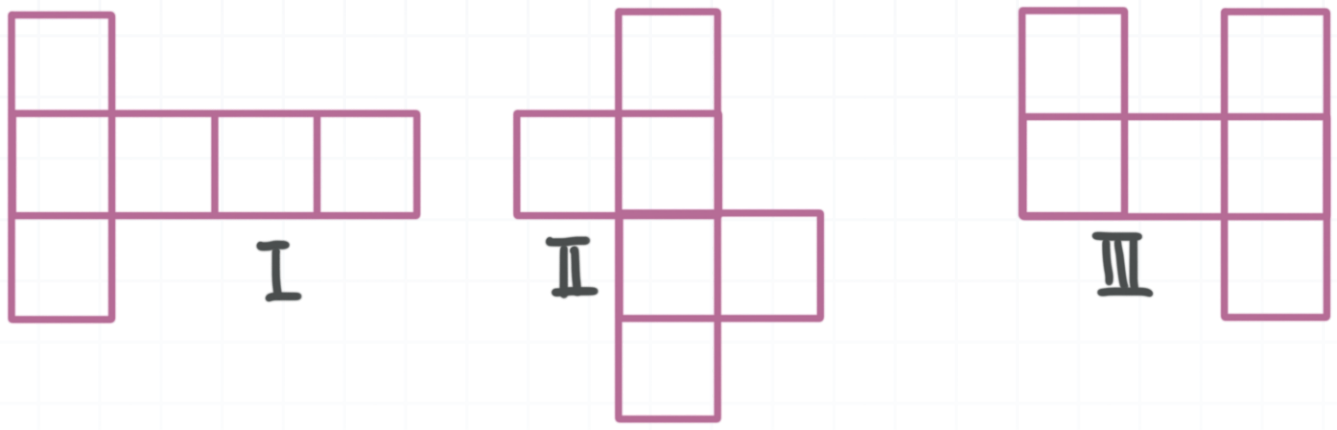
Question: Which net would not form a cube (a rectangular prism where all the faces are squares)?



Answer choices:

A I

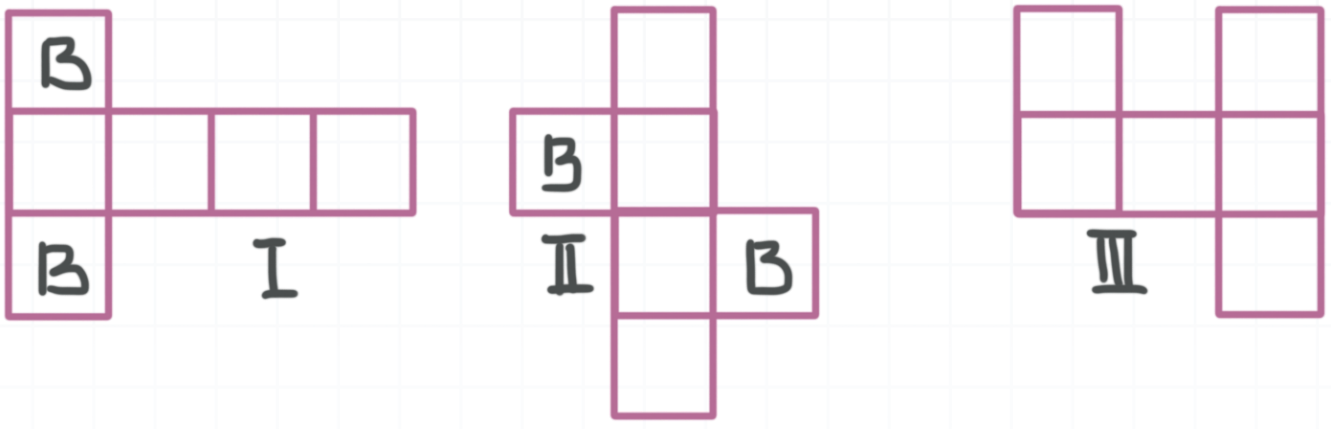
B II

C III

D Each of the nets would form a cube

Solution: C

A cube has six faces. In I and II, the row of four squares can be folded to make four faces of the cube. Then the other two squares can be folded to make the two bases.



In III, there aren't four squares in a row, which makes it impossible to fold that net into a cube.

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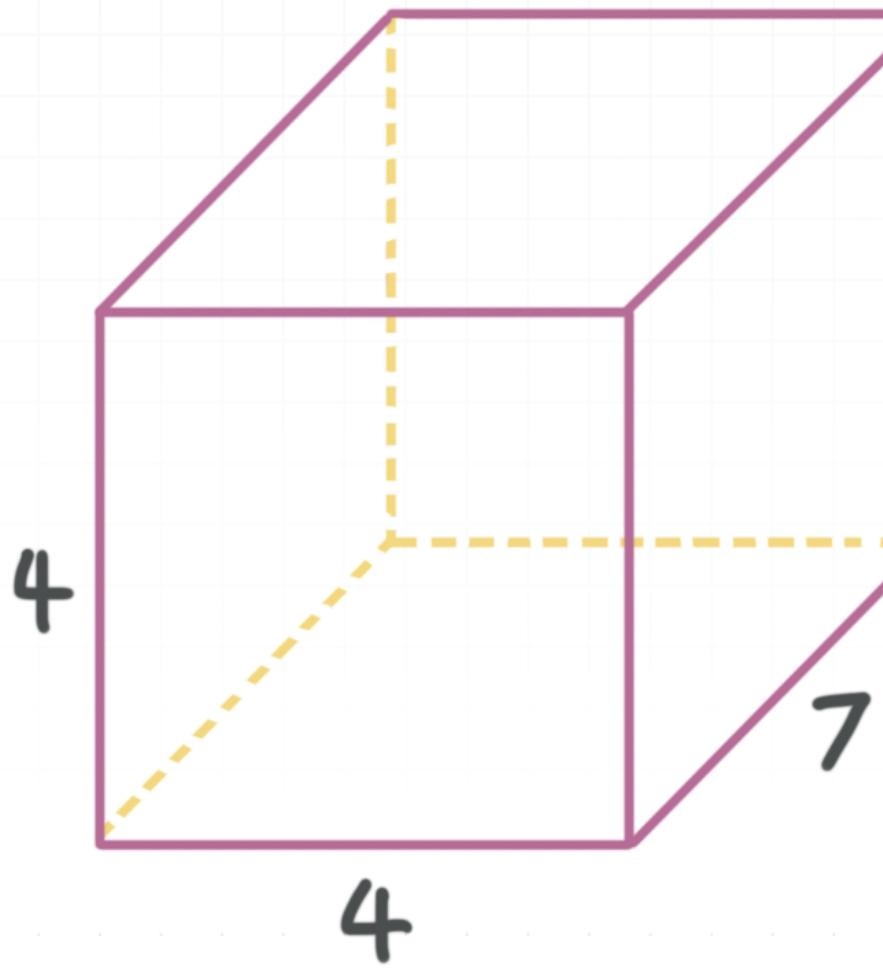
Question: What is the surface area of the given right rectangular prism (a rectangular prism in which all the faces are rectangles)?



Answer choices:

A 88

B 112

C 144

D 160

Solution: C

The surface area formula is

$$A = 2lw + 2wh + 2lh$$

And we've been given the dimensions

$$h = 4,\ w = 4,\ l = 7$$

So plugging these into the surface area formula, we get

$$A = (2 \cdot 7 \cdot 4) + (2 \cdot 4 \cdot 4) + (2 \cdot 7 \cdot 4)$$

$$A = 56 + 32 + 56$$

$$A = 144$$