



# ASVAB-SECTION-3<sup>Q&As</sup>

ASVAB Section Three : Mechanical Comprehension

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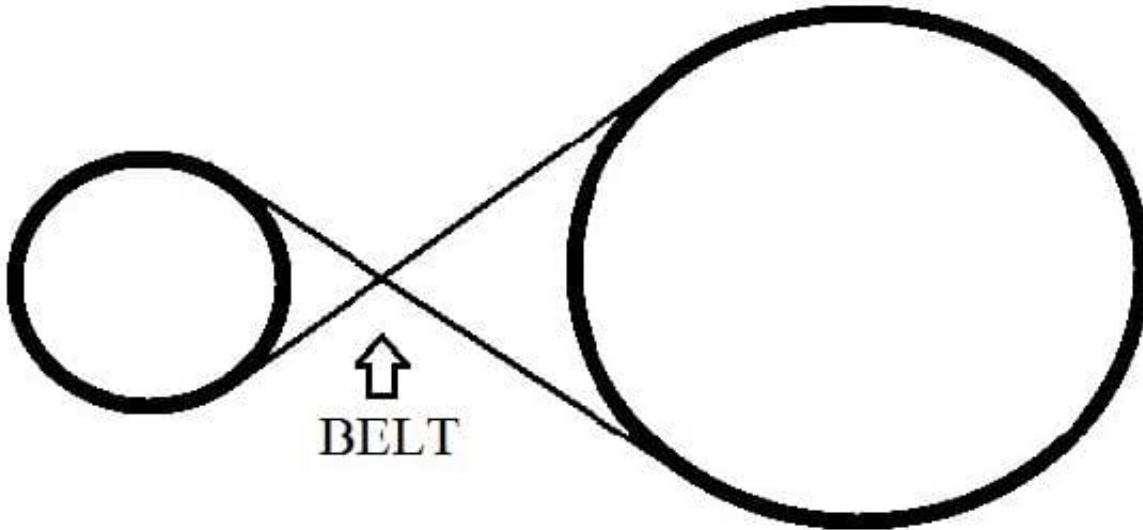




**QUESTION 1**

The wheels below are connected by a belt as shown.

If the larger wheel makes two revolutions, how many revolutions will the smaller wheel make?



A. Less than one

B. One

C. Two

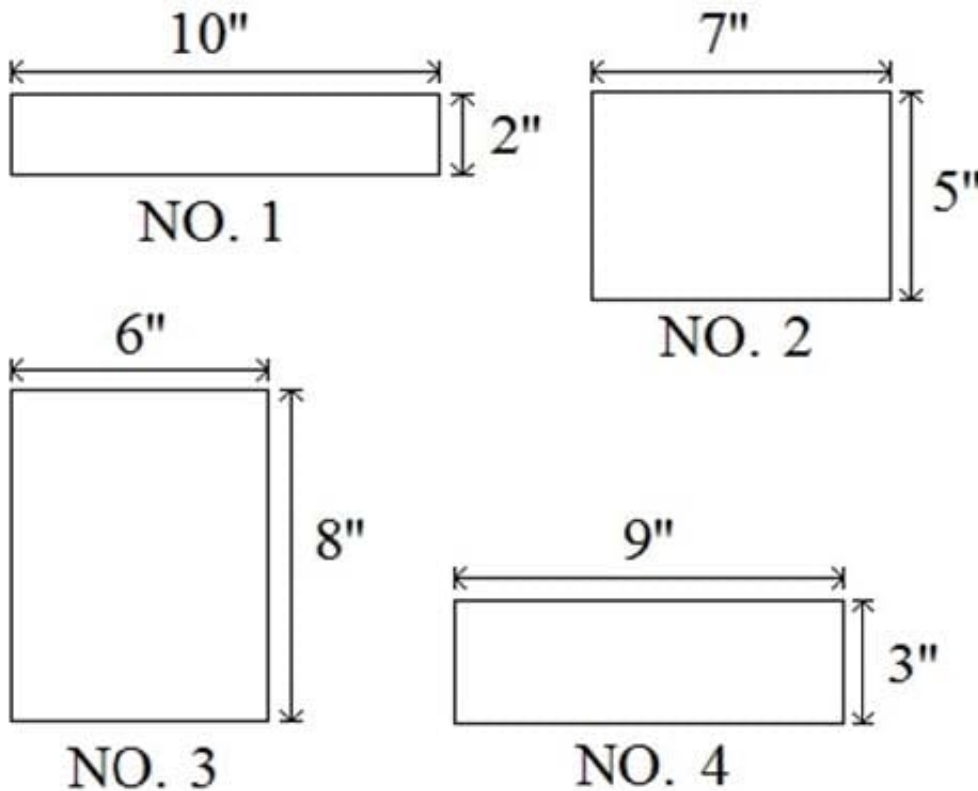
D. More than two

Correct Answer: D

We are not told the sizes of the two wheels, but we can see that one is larger than the other.

If the two wheels are connected by a belt, the small wheel will be forced to turn faster and complete more turns than the larger wheel.

**QUESTION 2**



The bottoms of four boxes are shown above. The boxes all have the same volume.

If postal regulations state that the sides of a box must meet a minimum height, which box is most likely to be too short to go through the mail?

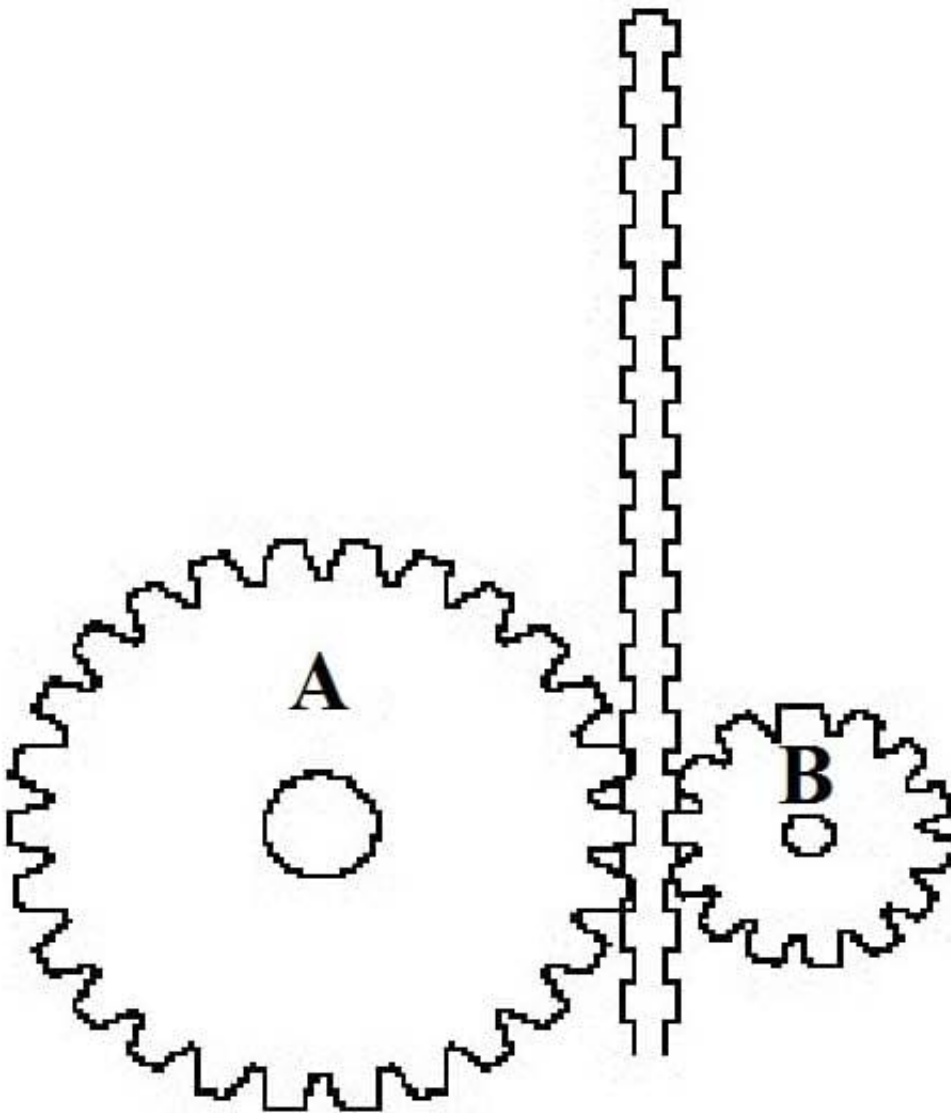
- A. NO. 4
- B. NO. 2
- C. NO. 1
- D. NO. 3

Correct Answer: D

The box with the largest area on the bottom will have the shortest sides. If length  $\times$  width  $\times$  height = volume, and all the boxes have equal volume, then the sides must be shortest on the box with the largest area on the bottom. Calculate the area of each box bottom: NO. 1 = 20 square inches; NO. 2 = 35 square inches; NO. 3 = 48 square inches; and NO. 4 = 27 square inches.

NO. 3, which has the largest area, will have the shortest sides.

### QUESTION 3



In the figure above, if the cogs move up the track at the same rate of speed, Cog A will \_\_\_\_\_.

- A. reach the top at the same time as Cog B
- B. reach the top after Cog B
- C. reach the top before Cog B
- D. have greater difficulty staying on track

Correct Answer: C

The larger cog (Cog A) covers a greater linear distance in a given period of time.

#### QUESTION 4

Which mechanical components are typically used between a wheel and an axle to reduce friction?

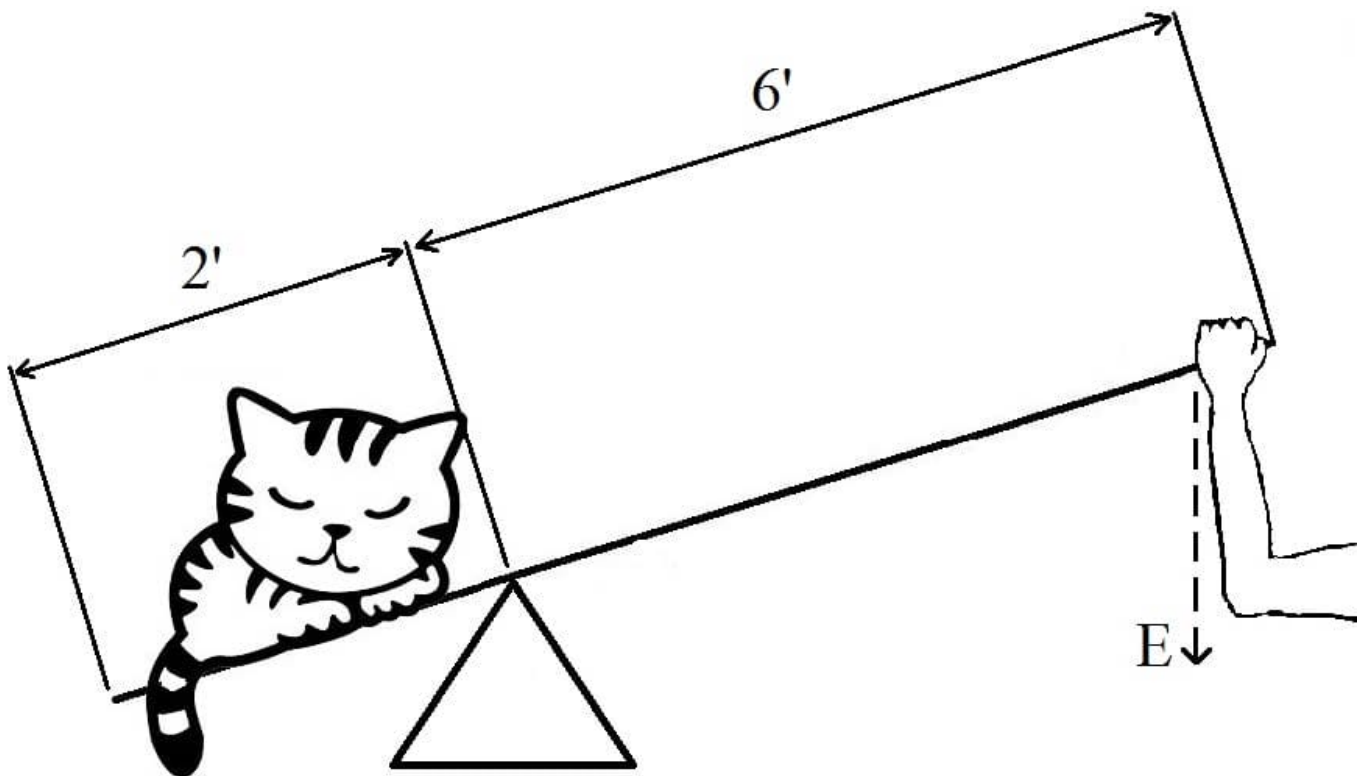


- A. springs
- B. hinges
- C. bearings
- D. levers

Correct Answer: C

A set of bearings is typically a set of small metal balls packed in a groove and lubricated with grease or oil. The wheel rubs against one side of each ball, and the axle rubs against the other side. The net effect is that the wheel rolls much more easily.

**QUESTION 5**



30 pound cat

What effort must be used to lift a 30-pound cat (see the figure above) using a first-class lever? (Don't include the weight of the lever in your calculations.)

- A. 10 pounds
- B. 15 pounds
- C. 50 pounds
- D. 5 pounds



Correct Answer: A

E stands for effort needed.  $30$  (weight of the cat)  $\times 2$  (length of resistance arm) =  $x \times 6$  (length of effort arm). Do a little multiplication, and you get  $60 = 6x$ .

To isolate  $x$ , divide each side by  $6$ :

$60 \div 6 = 6x \div 6$ , or  $10 = x$ .

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