

# Drawing and interpreting real-life graphs

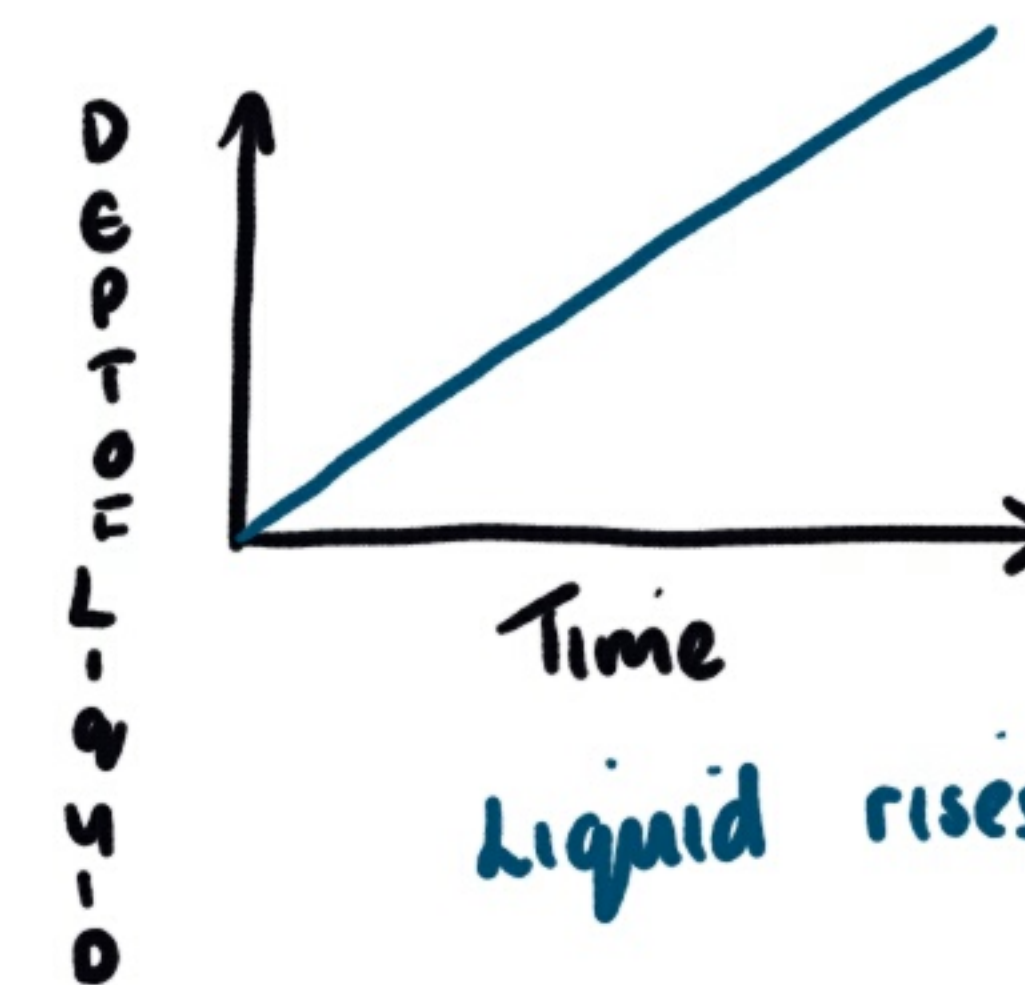
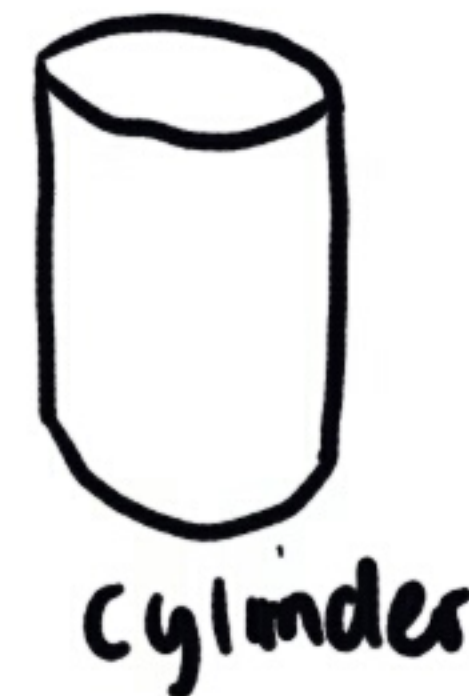
chapter

20

407

## Section 20.3 Real-life graphs

Examines a liquid being poured into various shaped vessels.

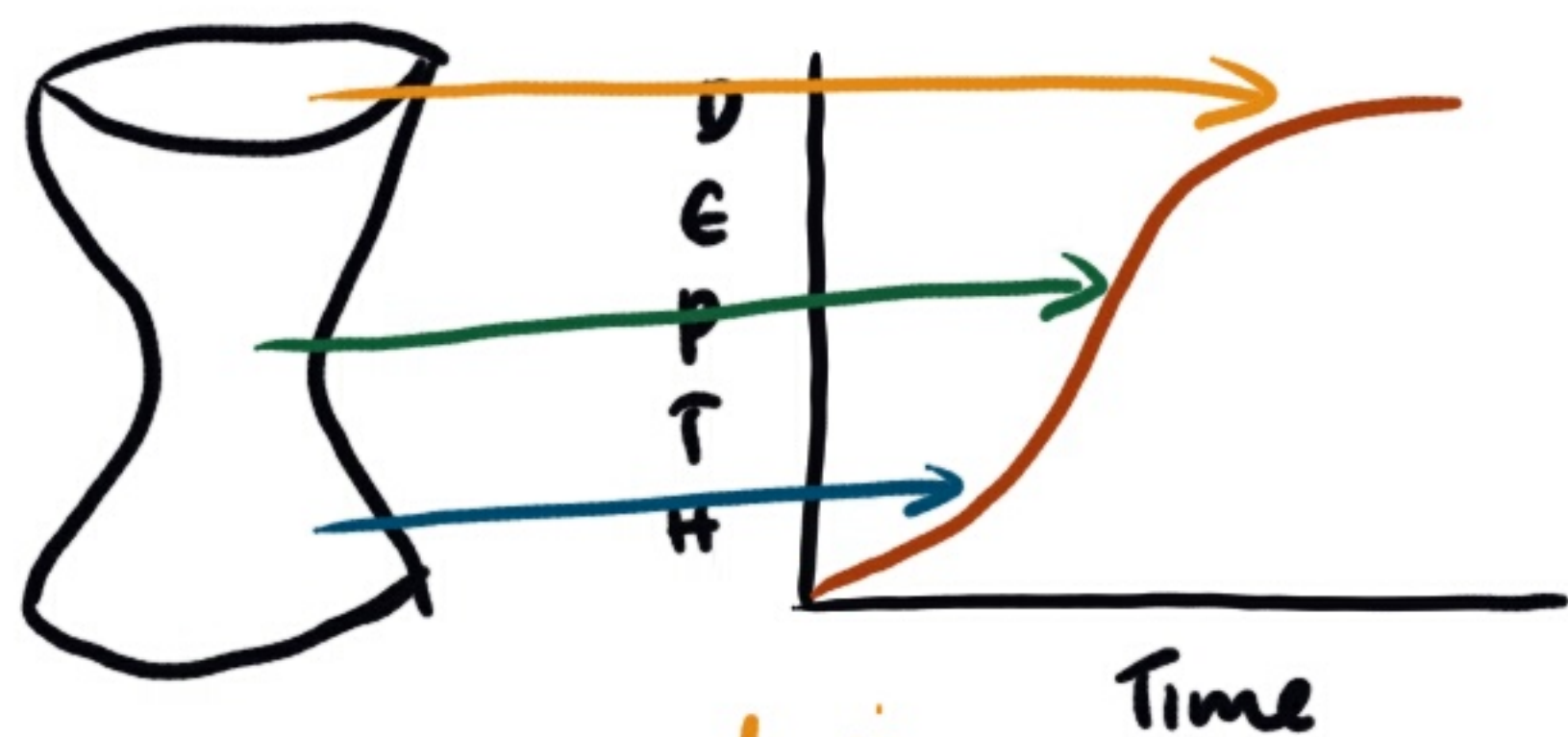
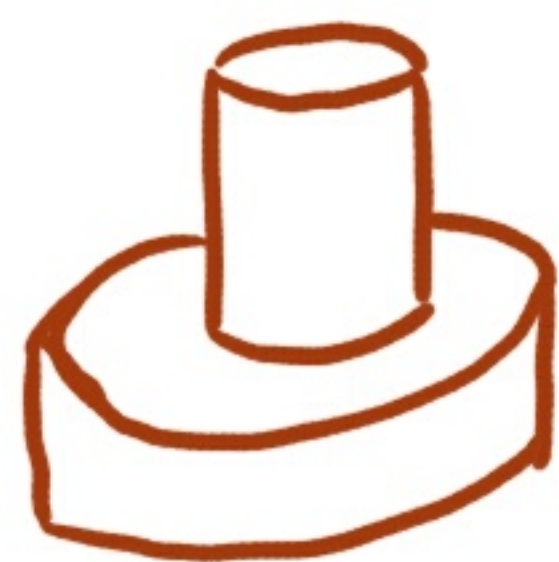


The wider the vessel the less steep the graph

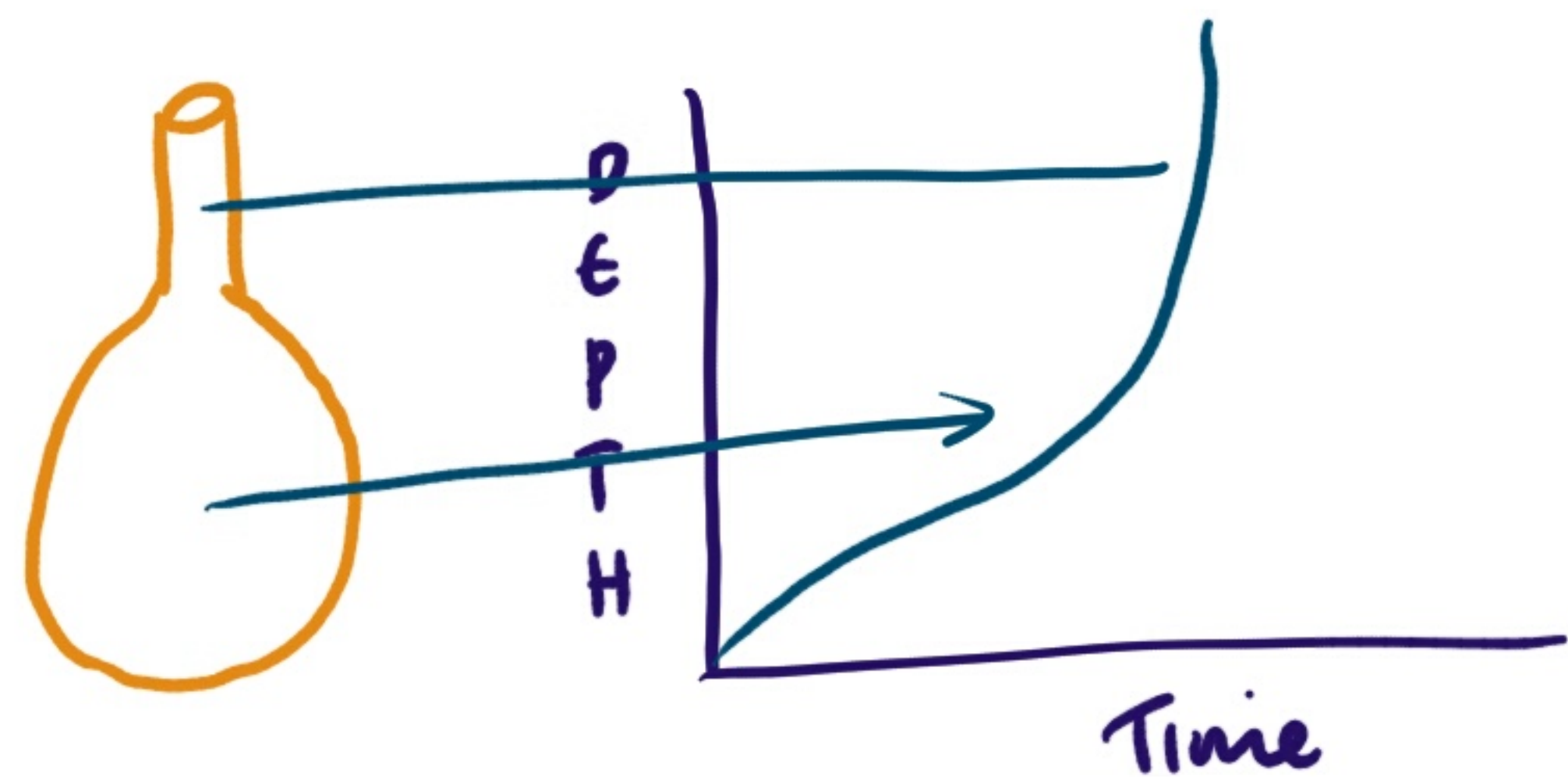


# Different shaped vessels.

①

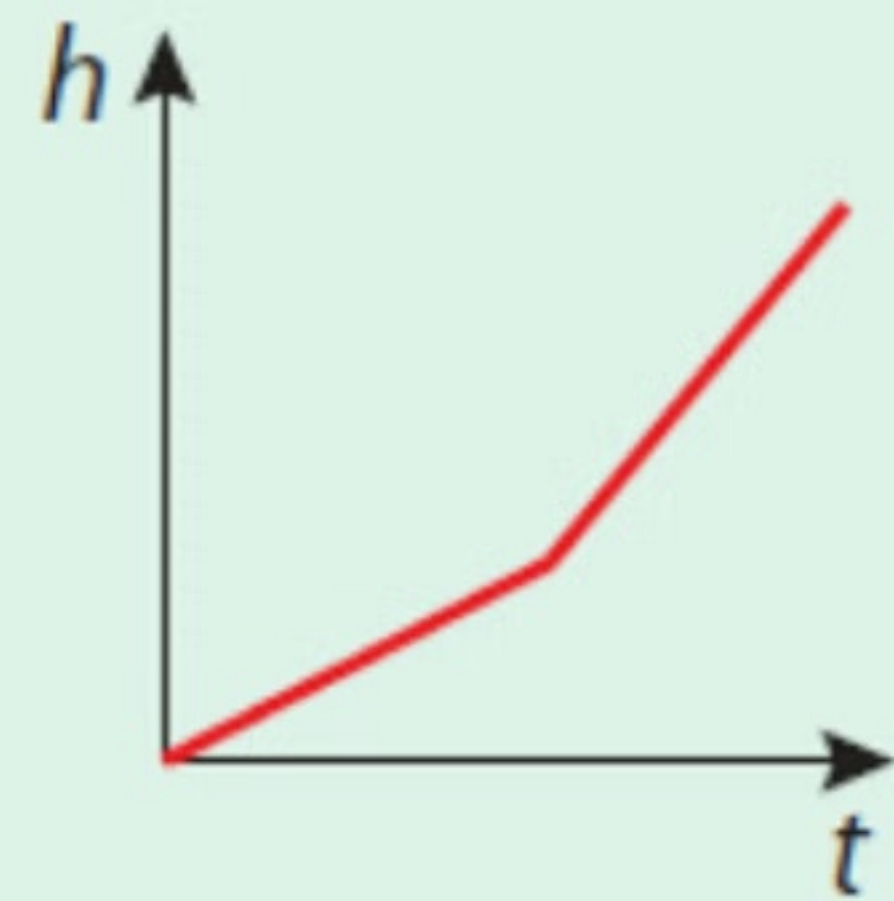
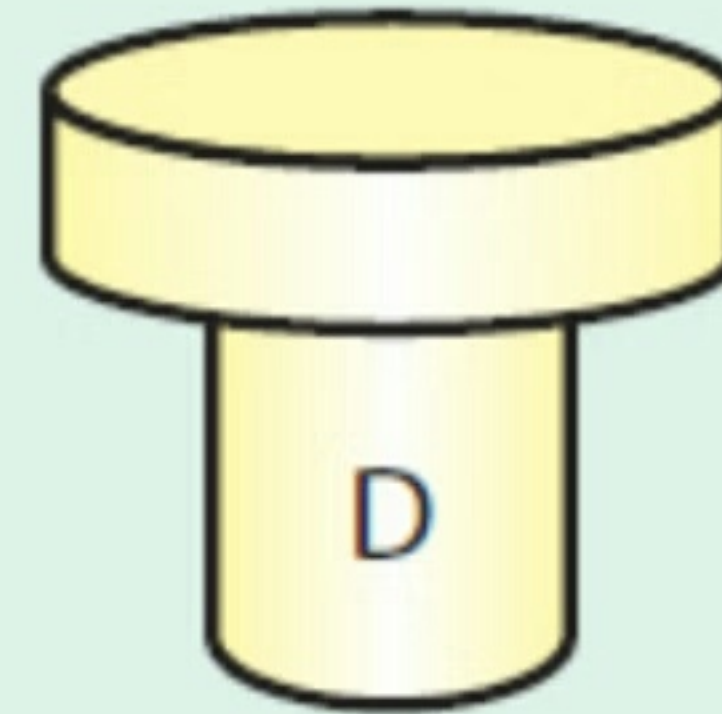
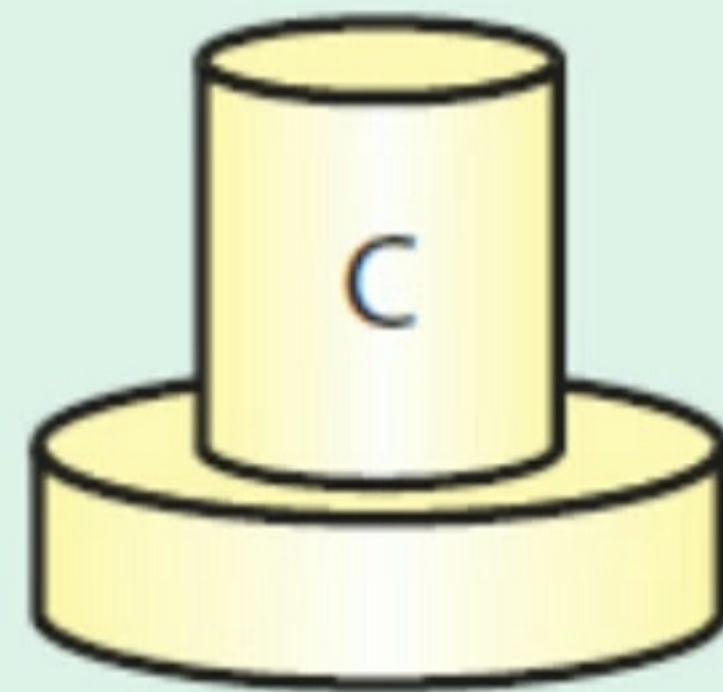
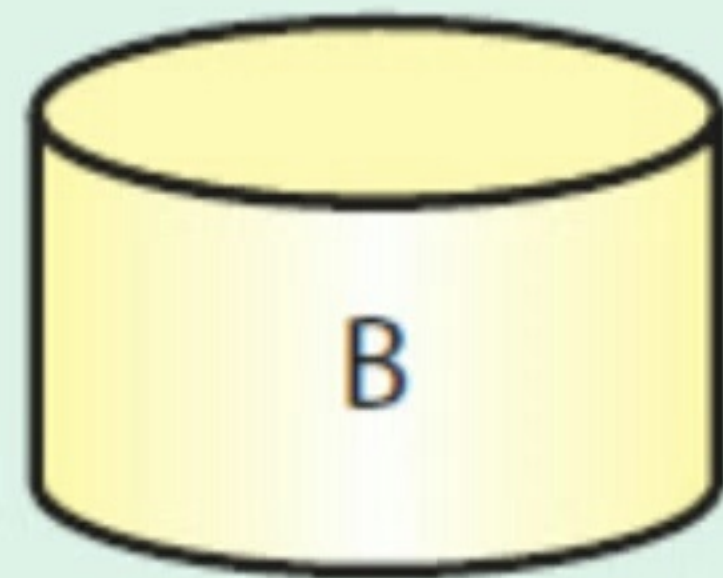
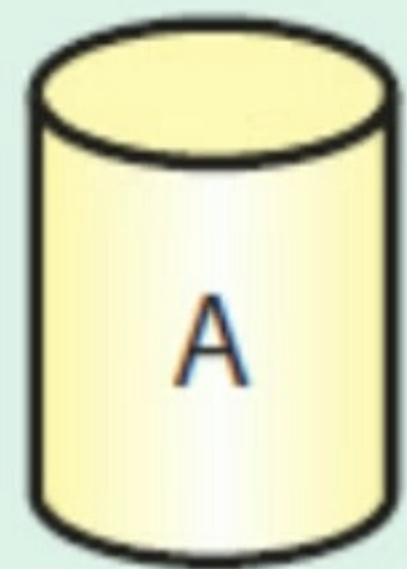


When vessel is curved the graph will be curved.

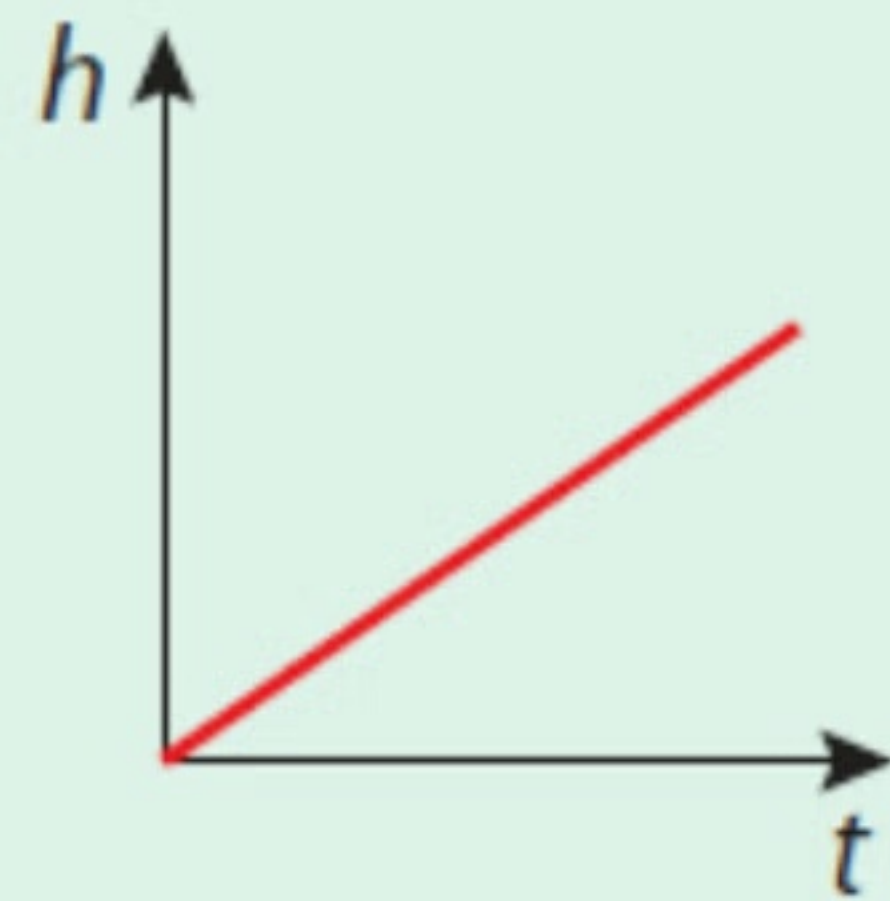


## Example 1

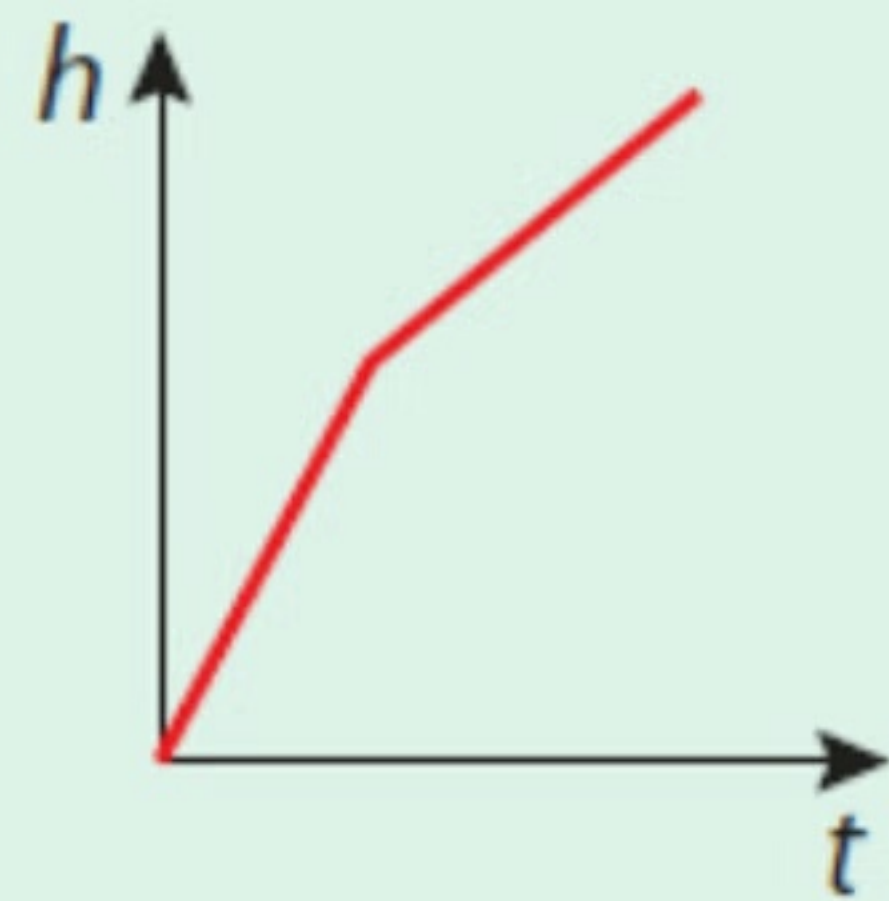
Match these containers to their graphs when they are filled with liquid at a constant rate.



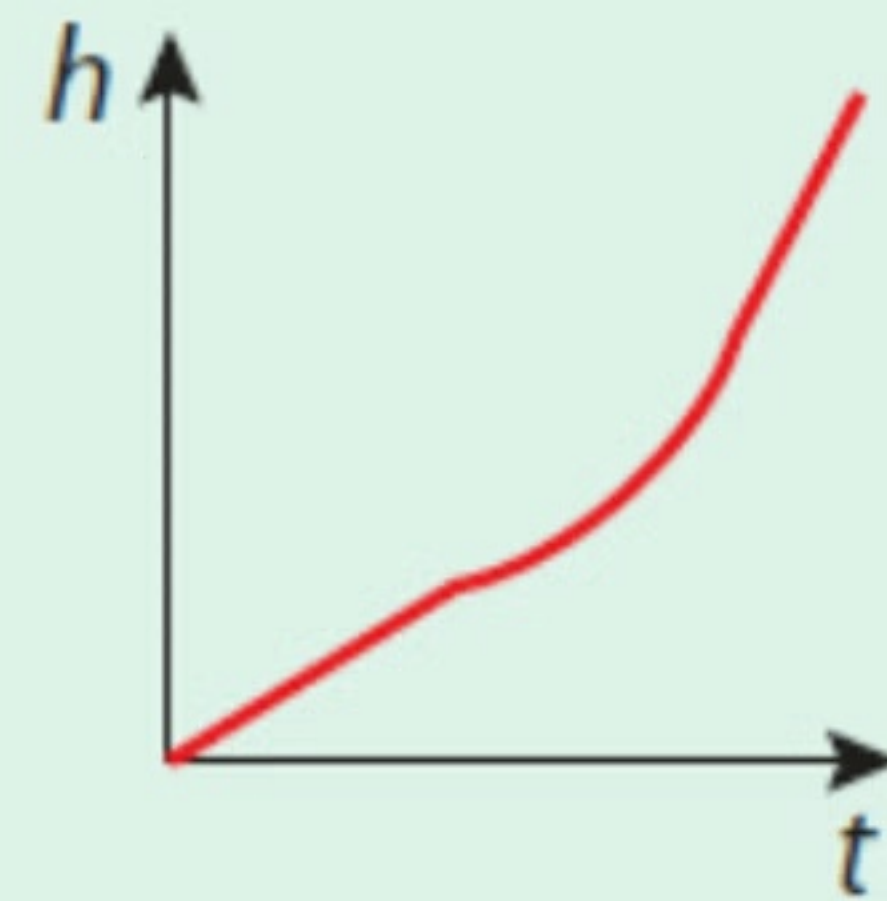
①



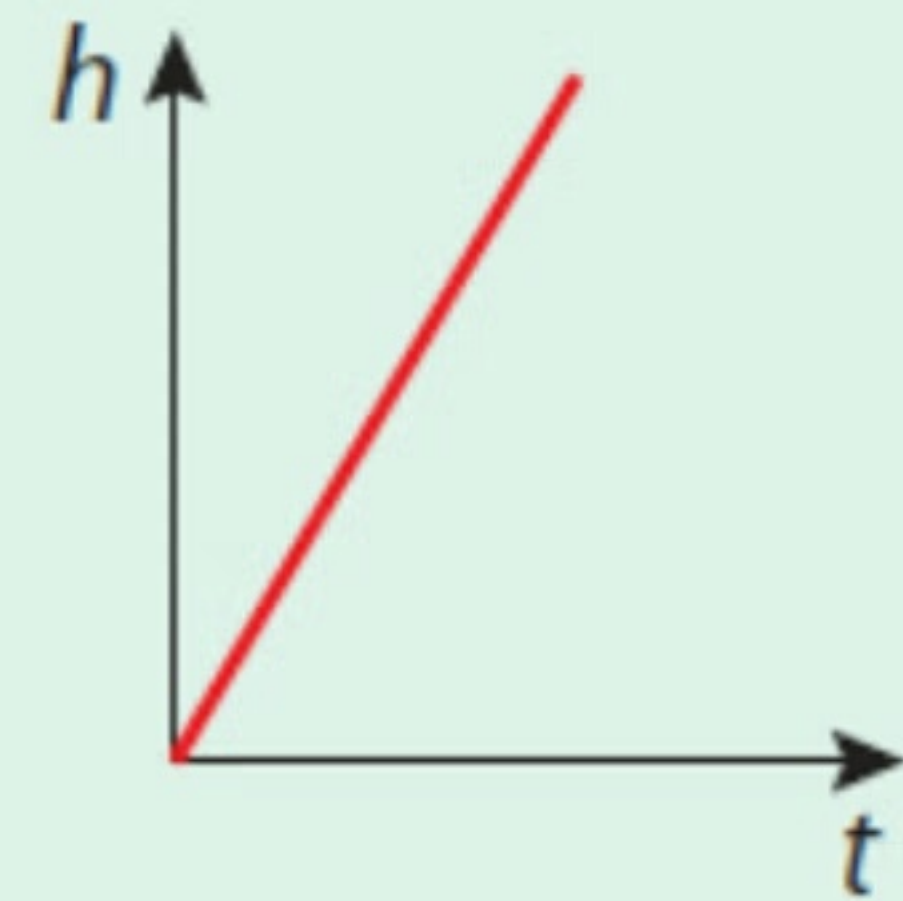
②



③



④

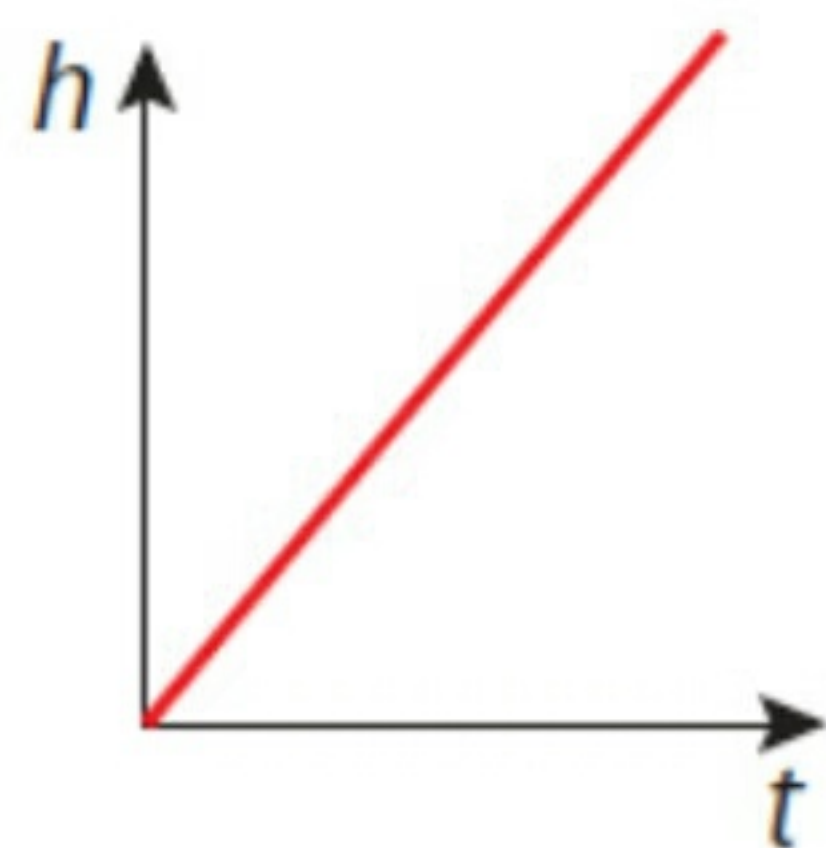
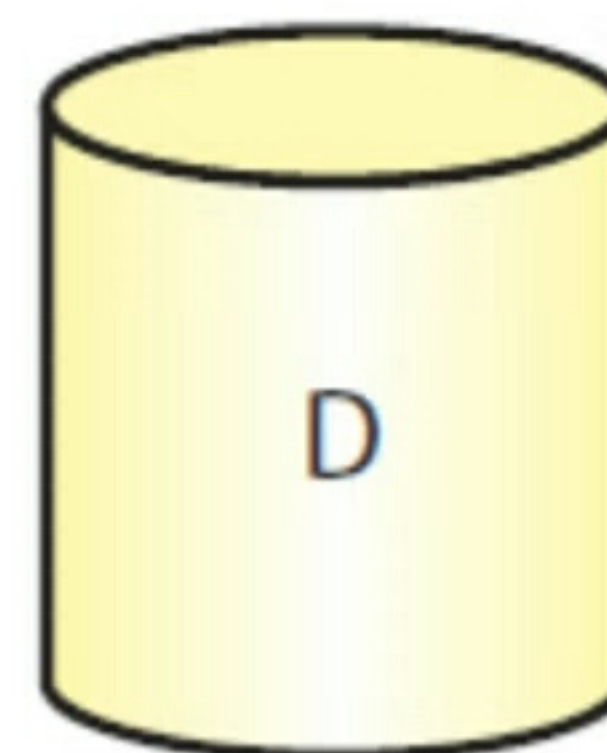
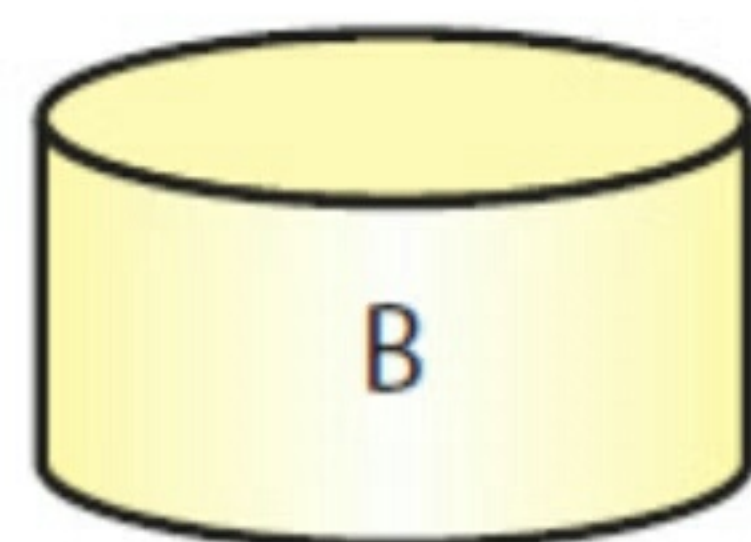
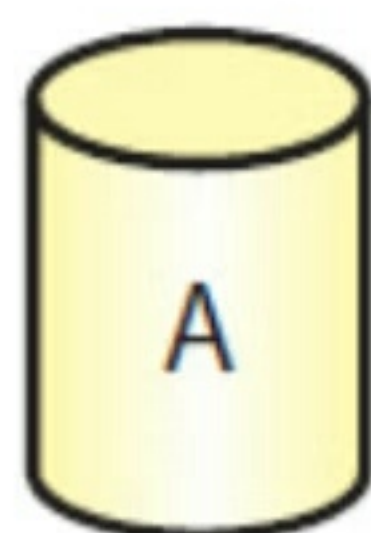


⑤

## Exercise 20.3 Pg 408

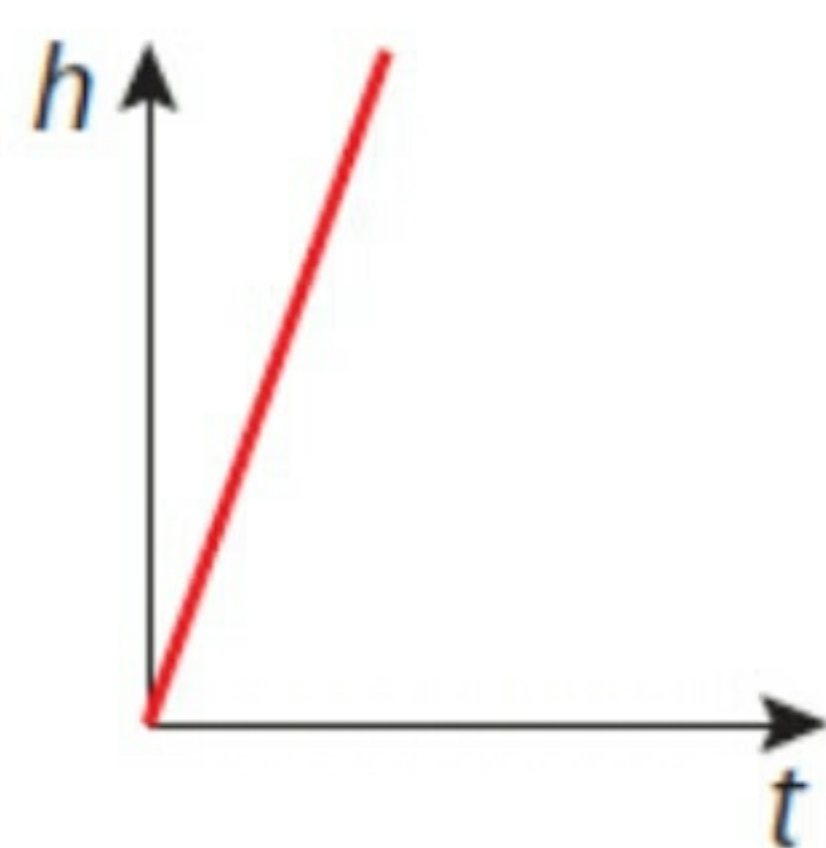
1. Water is poured at the same rate into each of these containers.

Match these containers with their graphs showing the rate at which the water is rising.



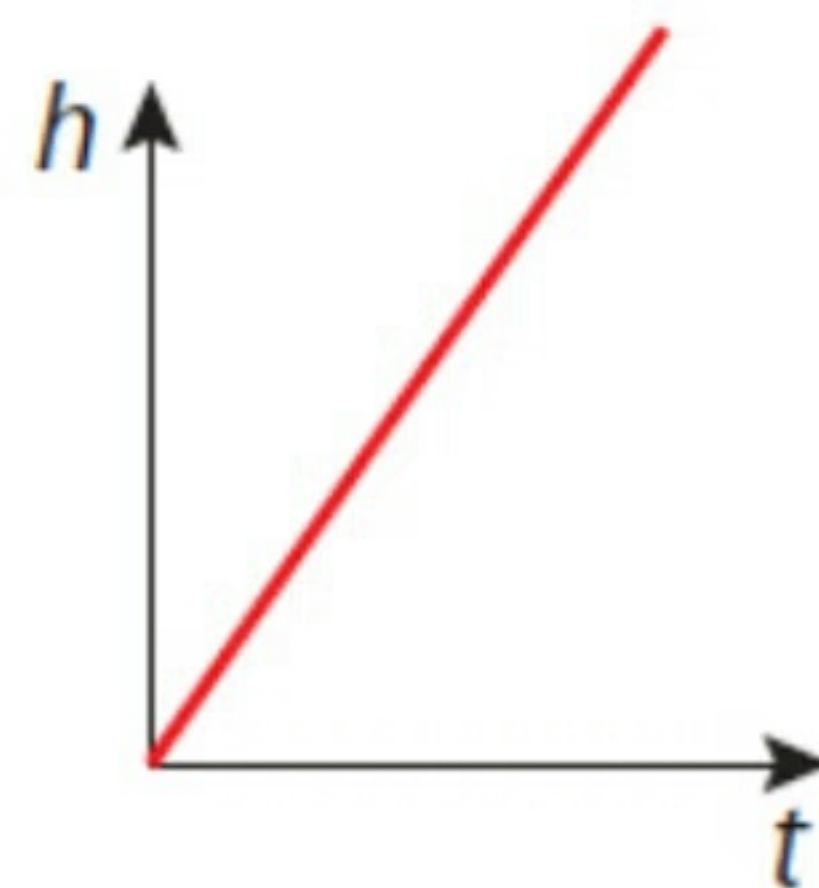
①

$$A=1$$



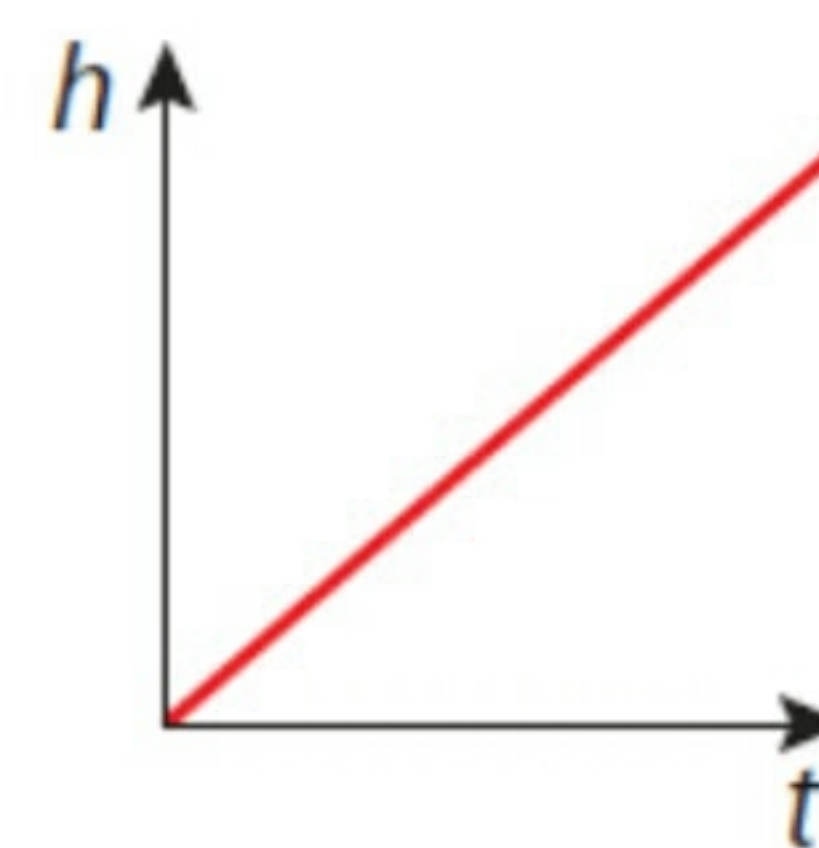
②

$$B=5$$



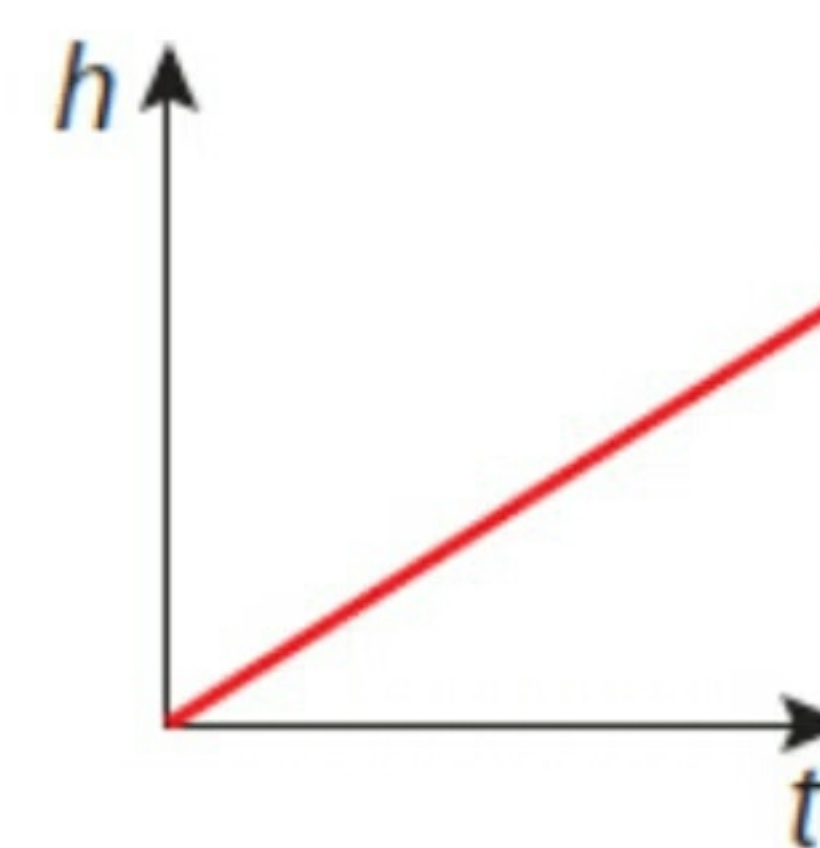
③

$$C=2$$



④

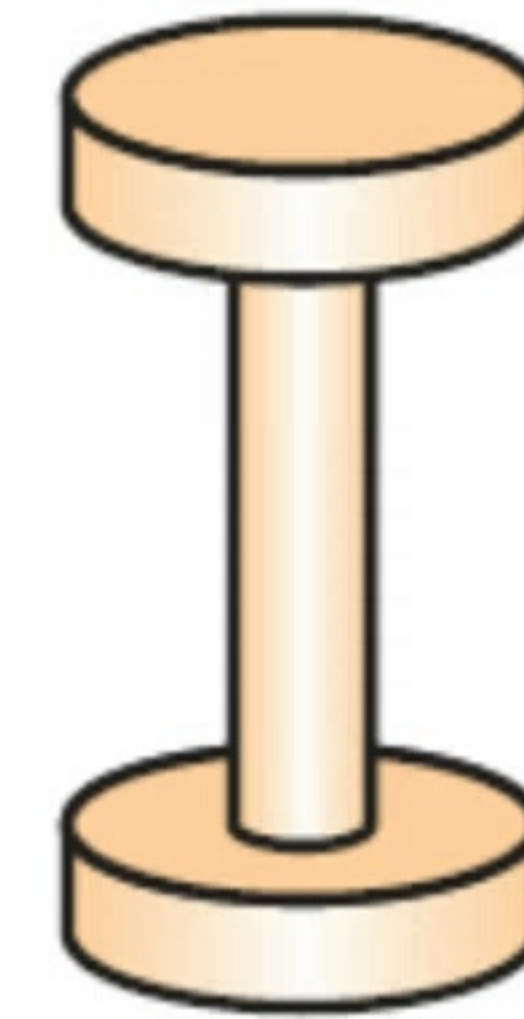
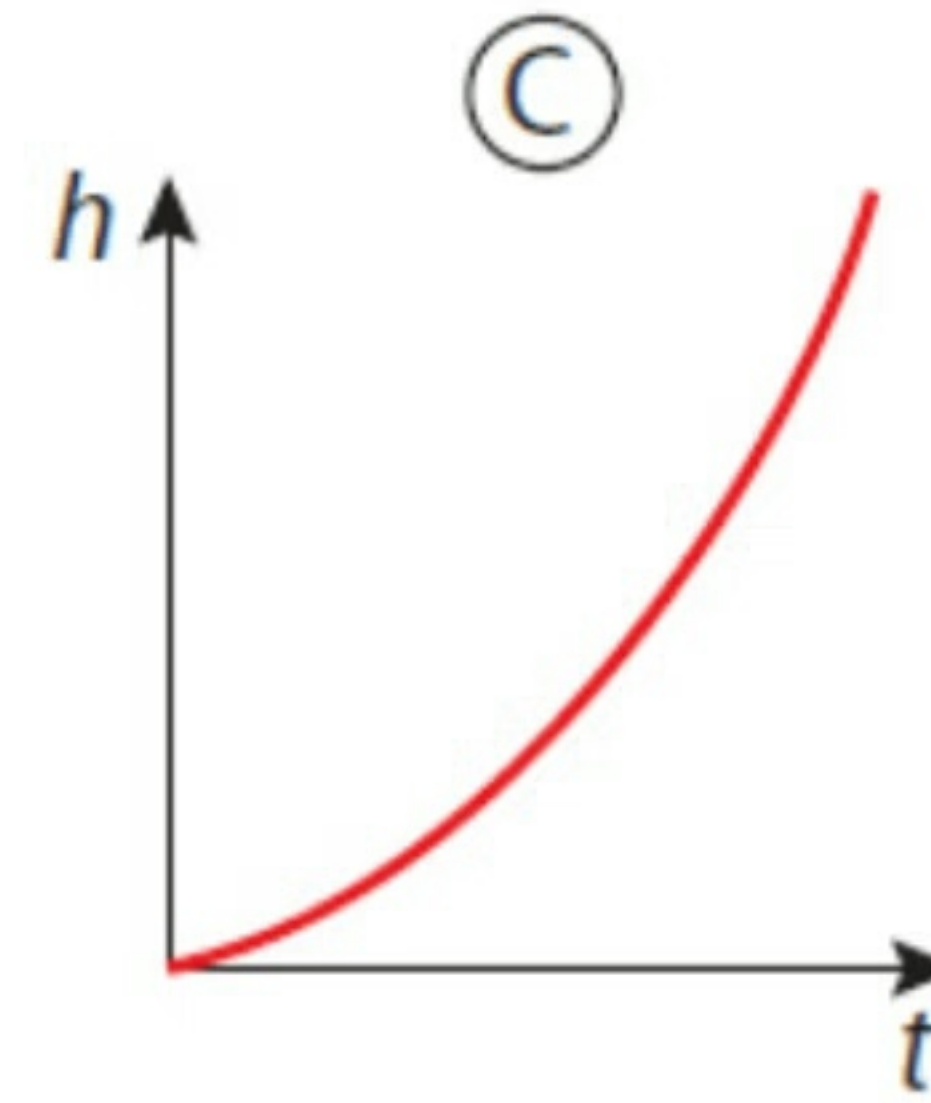
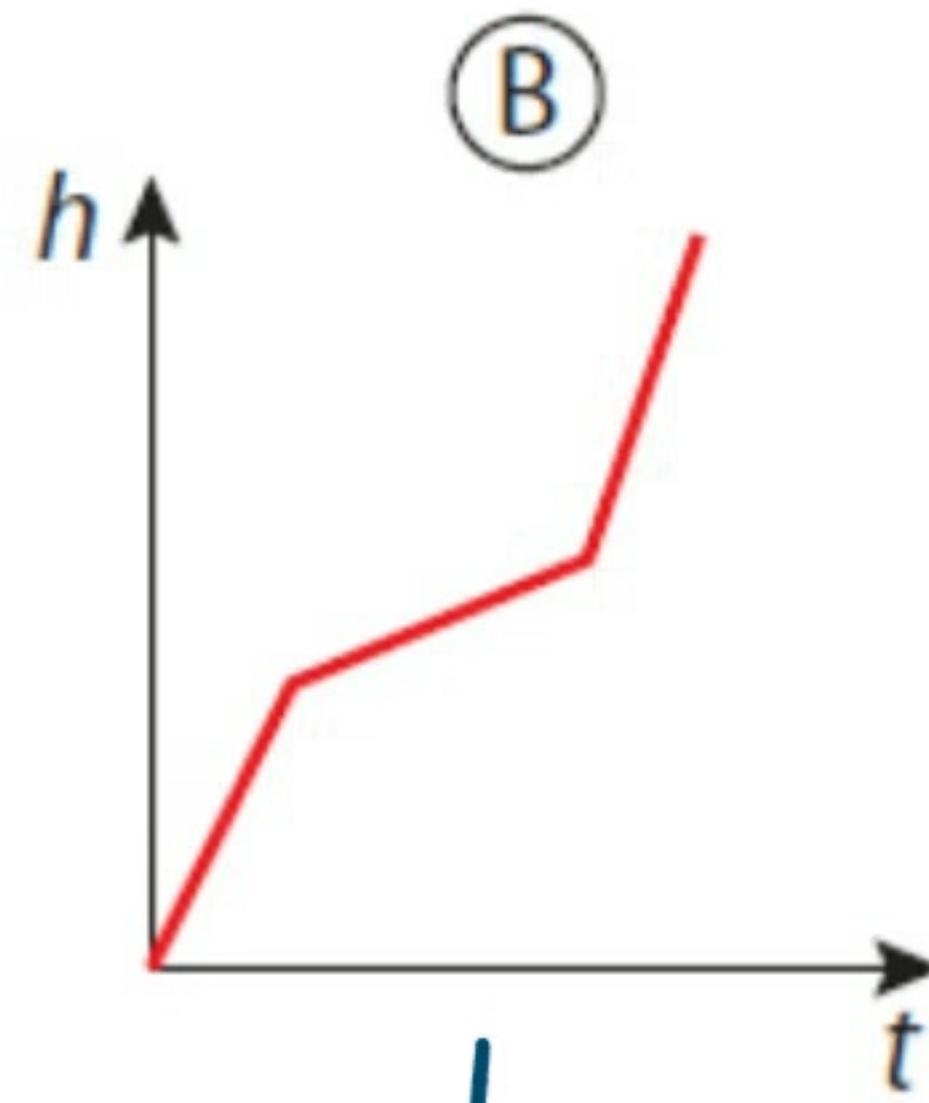
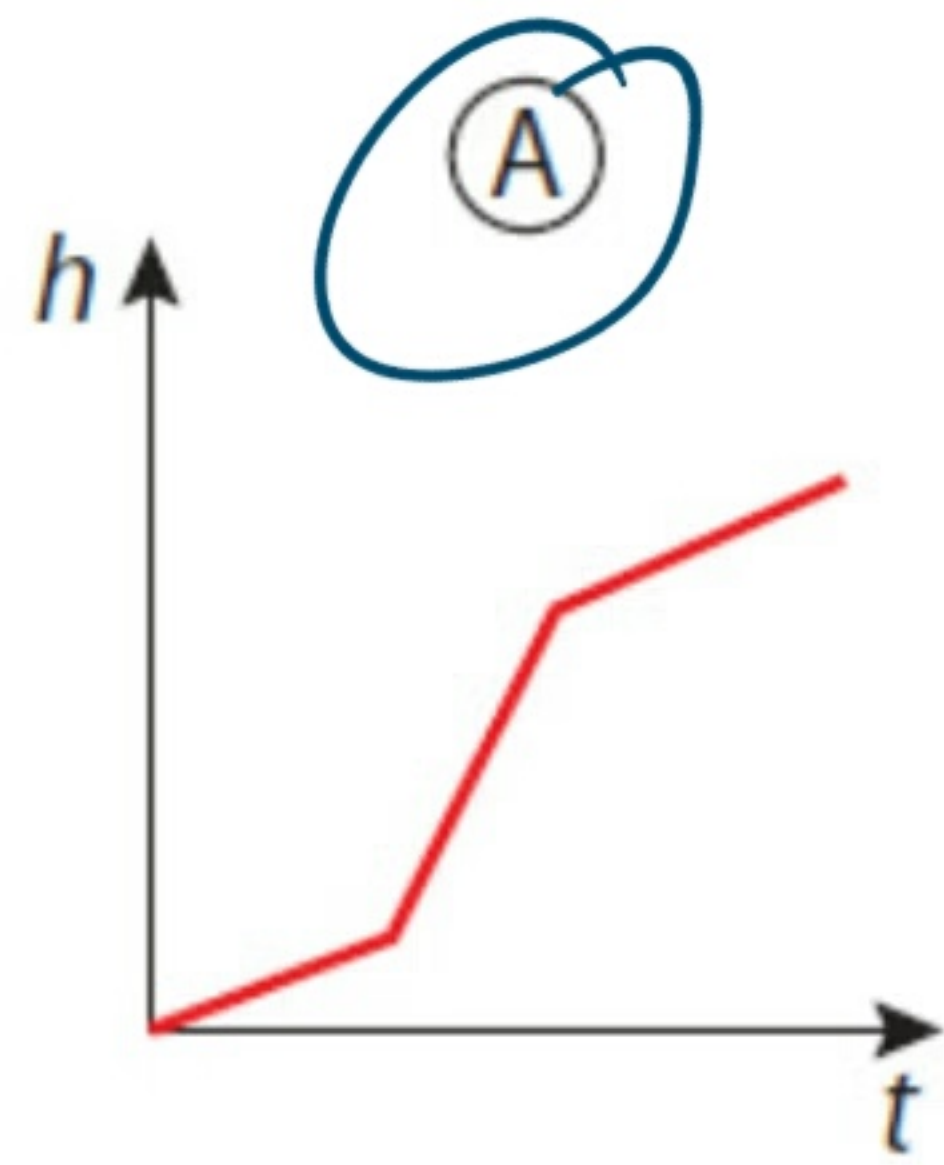
$$D=4$$



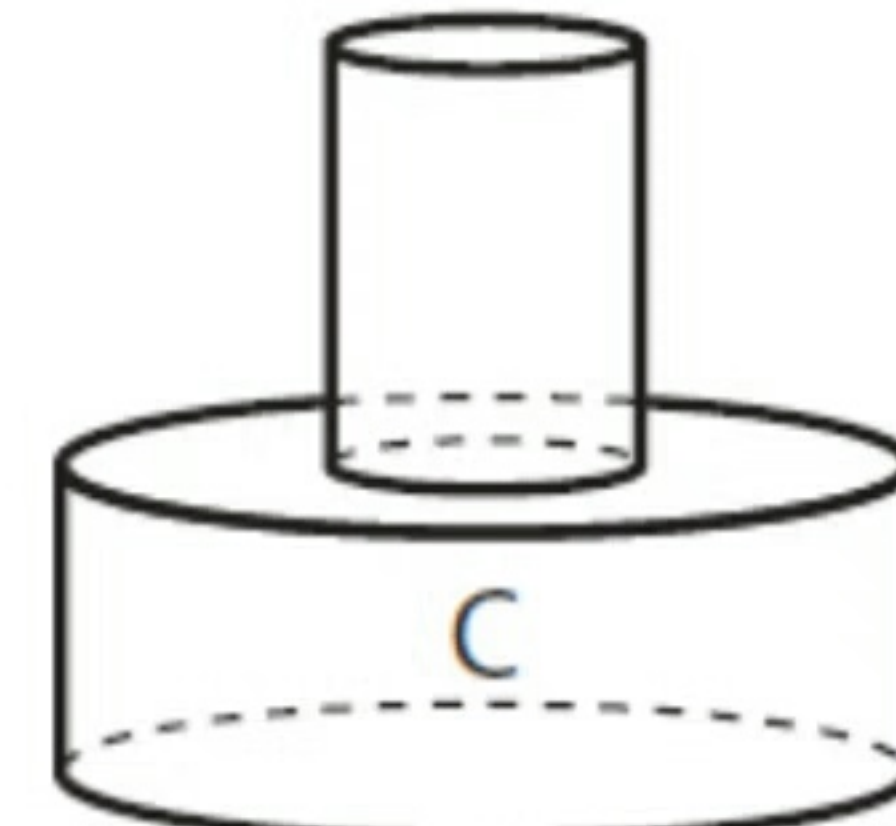
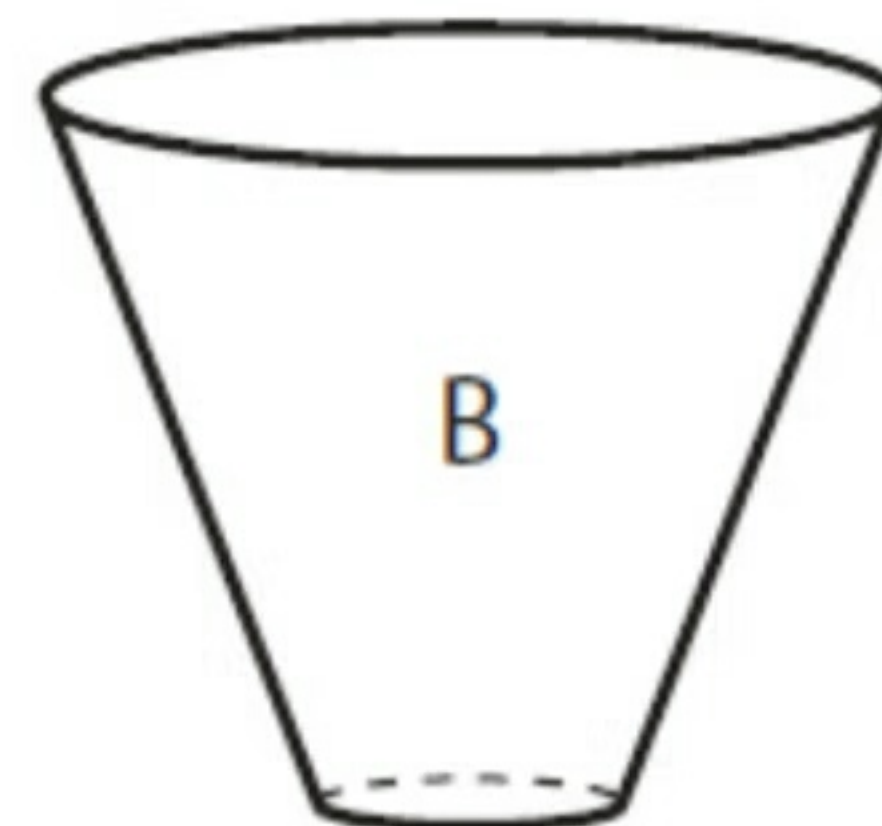
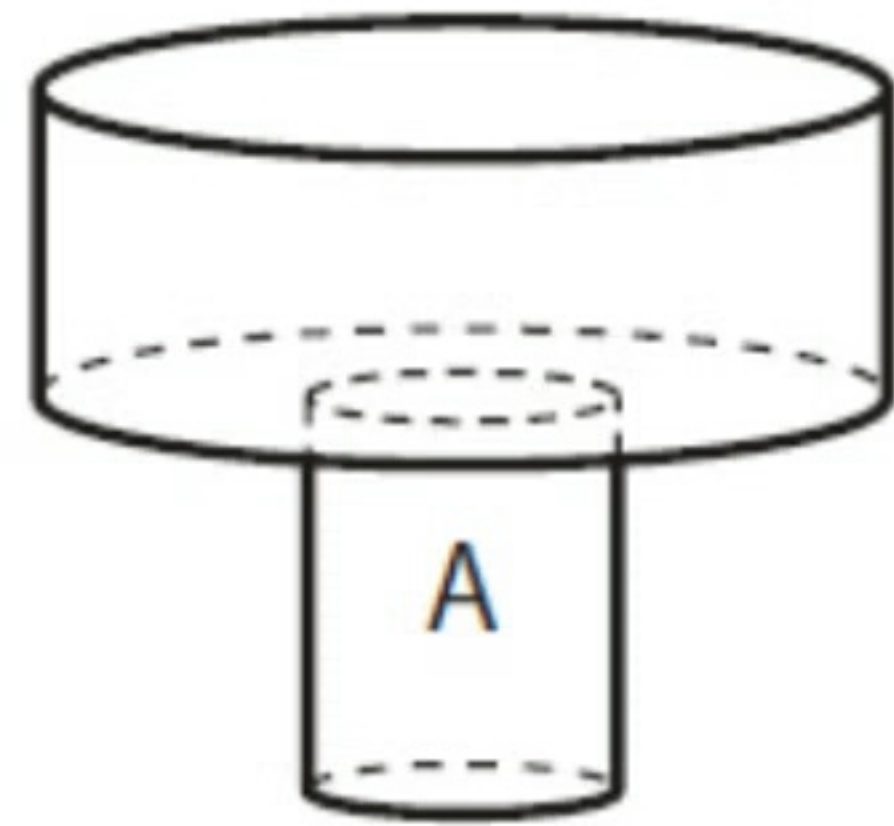
⑤

$$E=3$$

2. Water is added to the tank shown at a steady rate.  
Which graph best represents the increase in the water level  $h$ ?



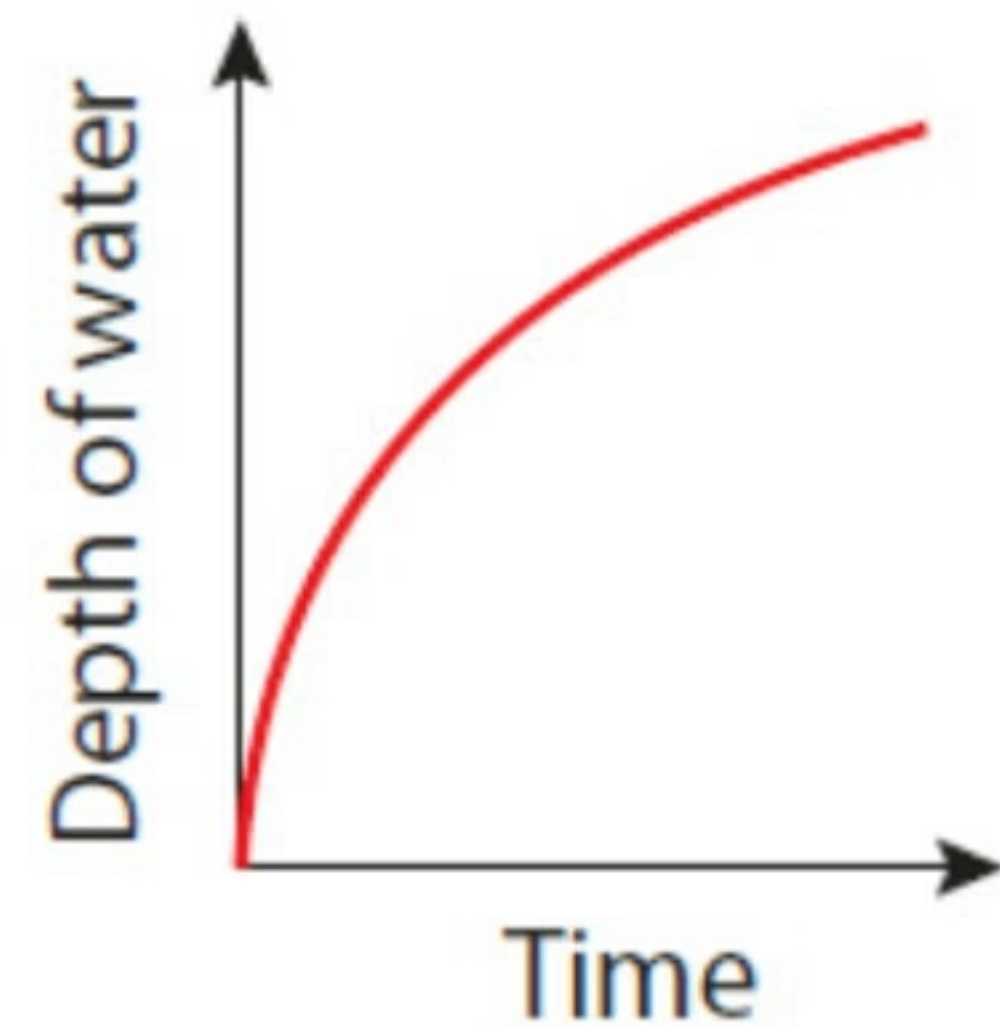
3. Here are three different-shaped bowls.



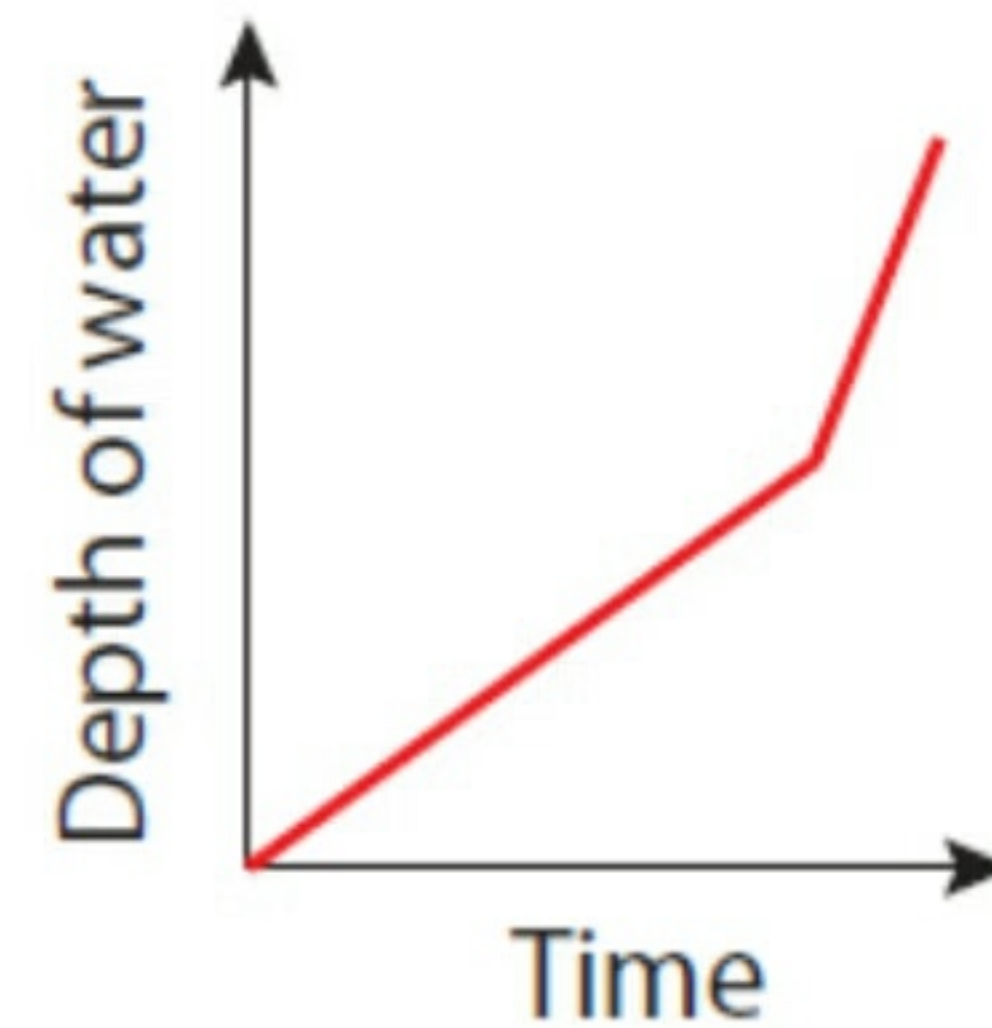
(i) Which description of filling the bowls with water goes with which bowl?

- (a) The water level goes up fast at first and then suddenly goes up more slowly. **A**
- (b) The water level goes up slowly at first, then changes to go up more quickly. **C**
- (c) The water level starts by going up quickly, but gets slower and slower. **B**

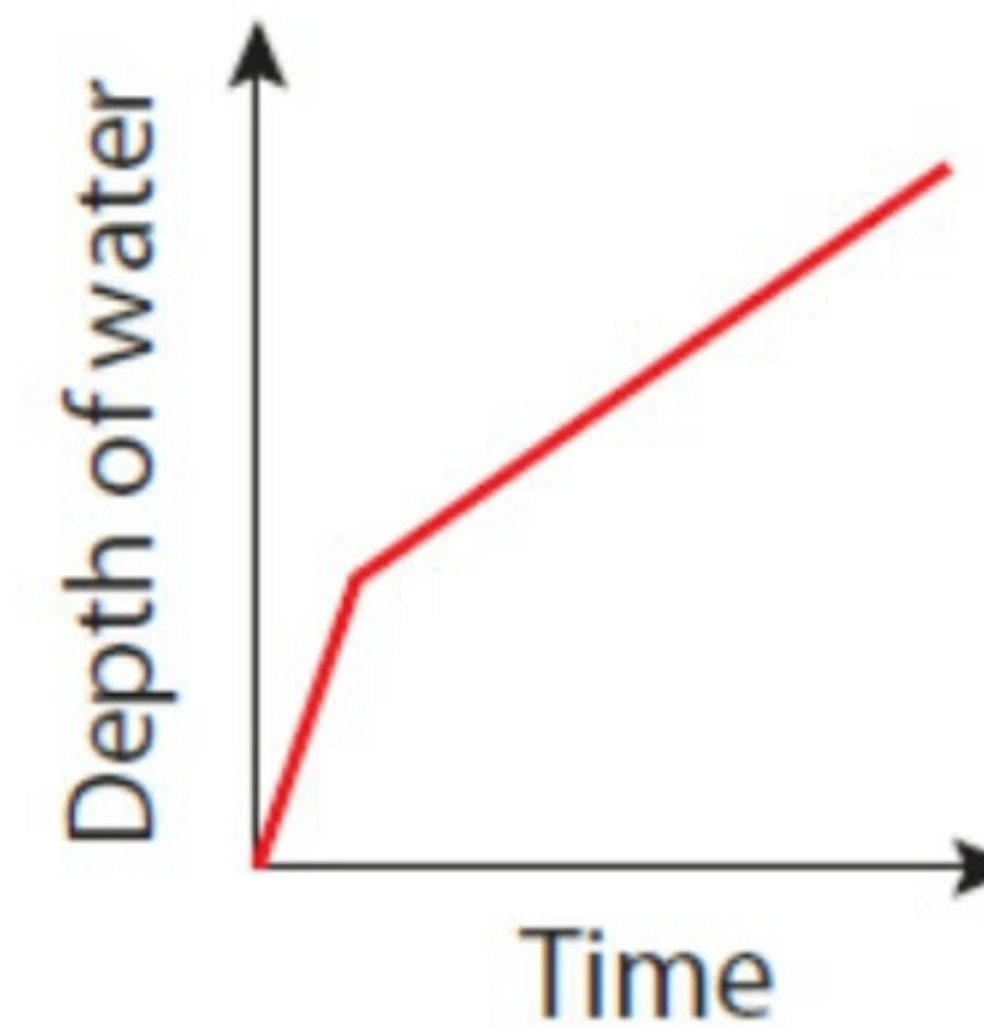
(ii) Which graph goes with which bowl?



**B**

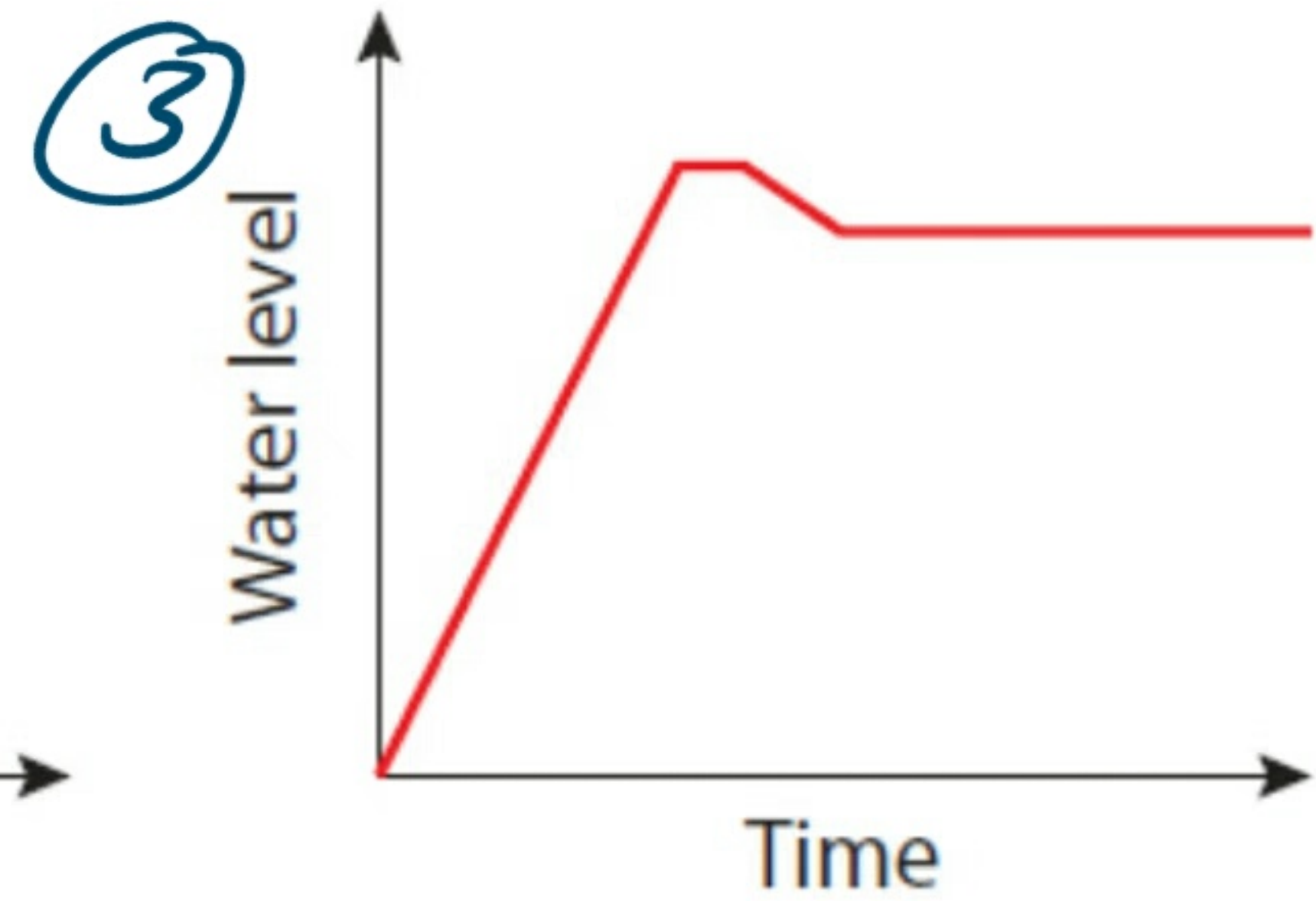
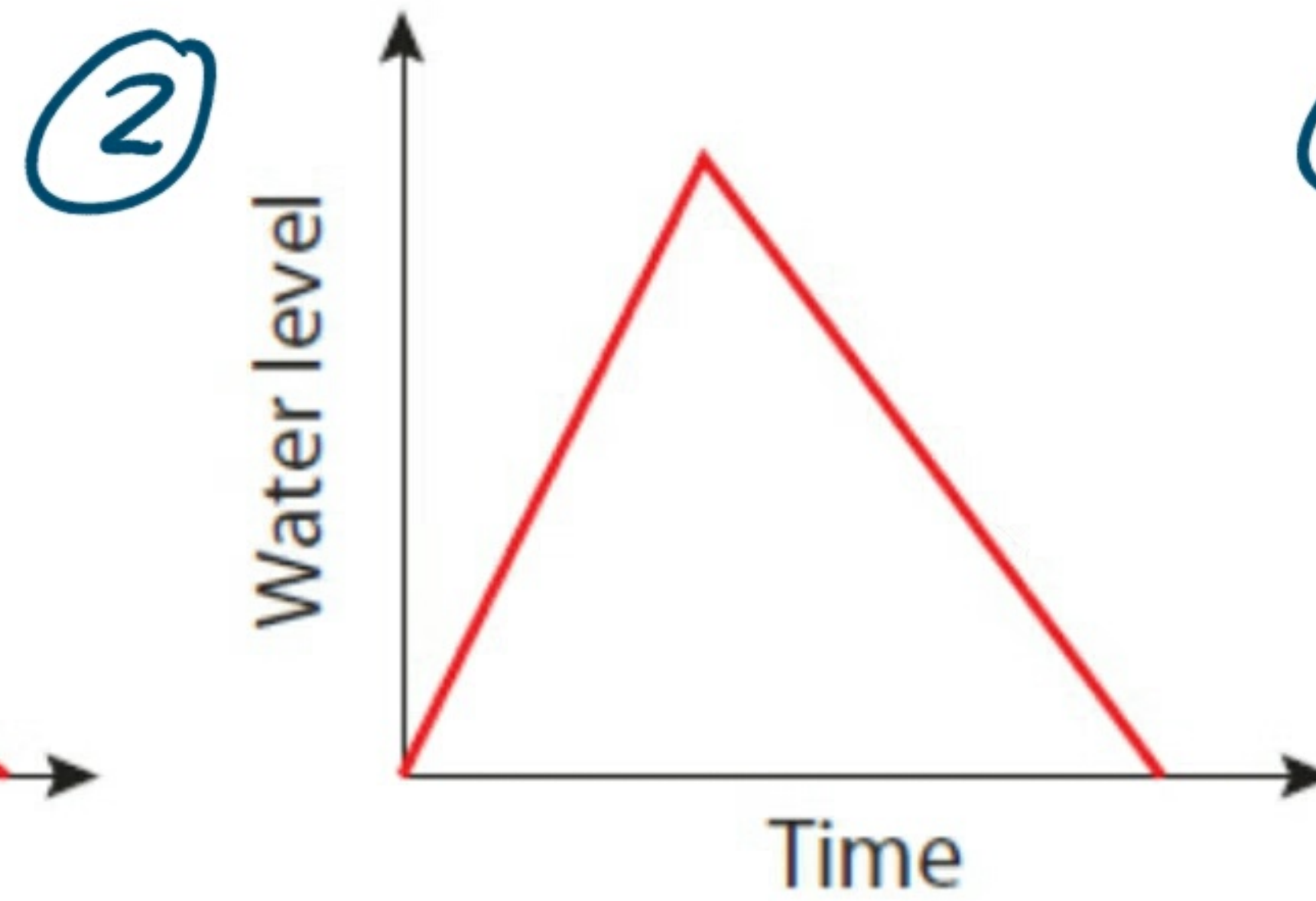
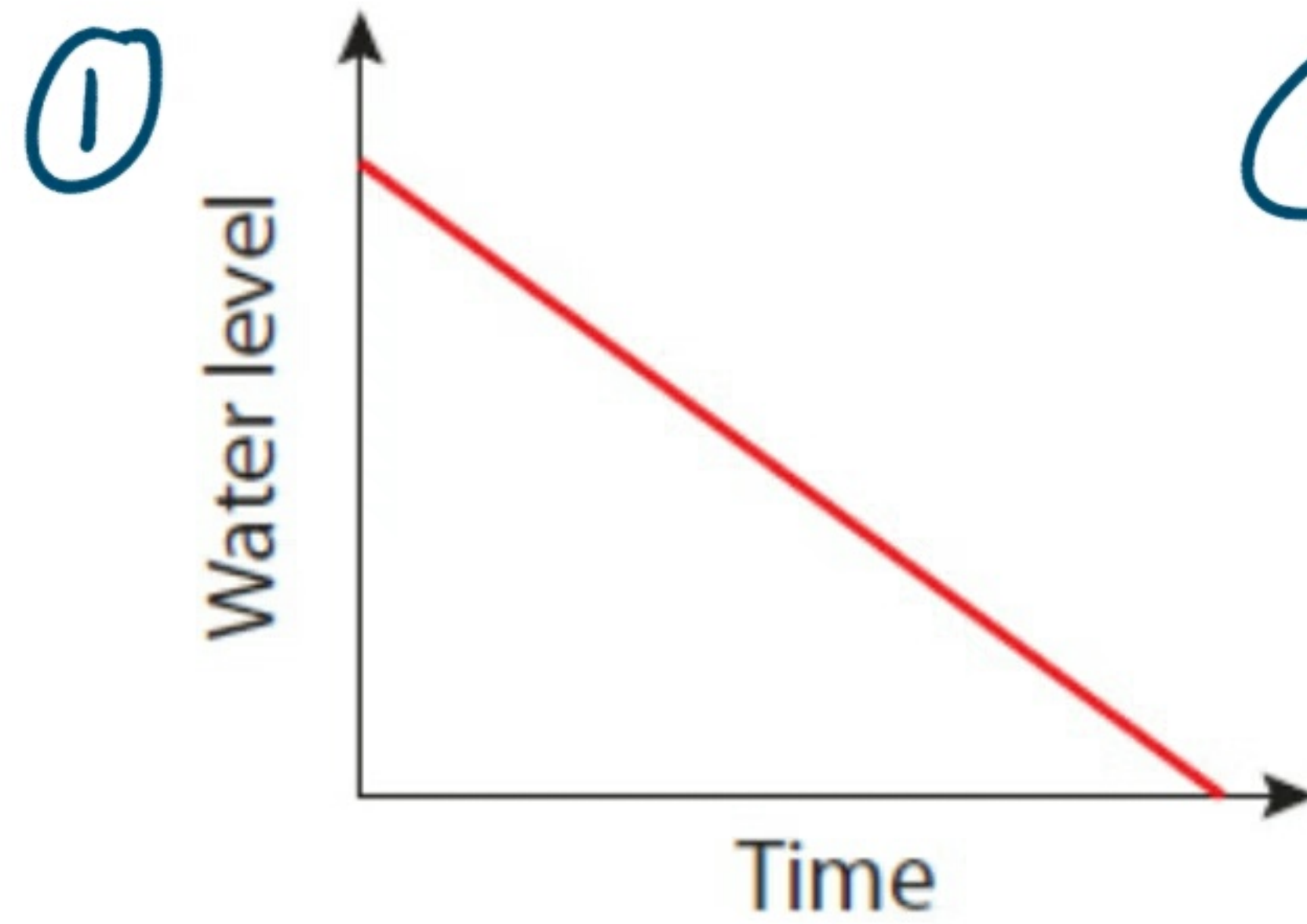


**C**



**A**

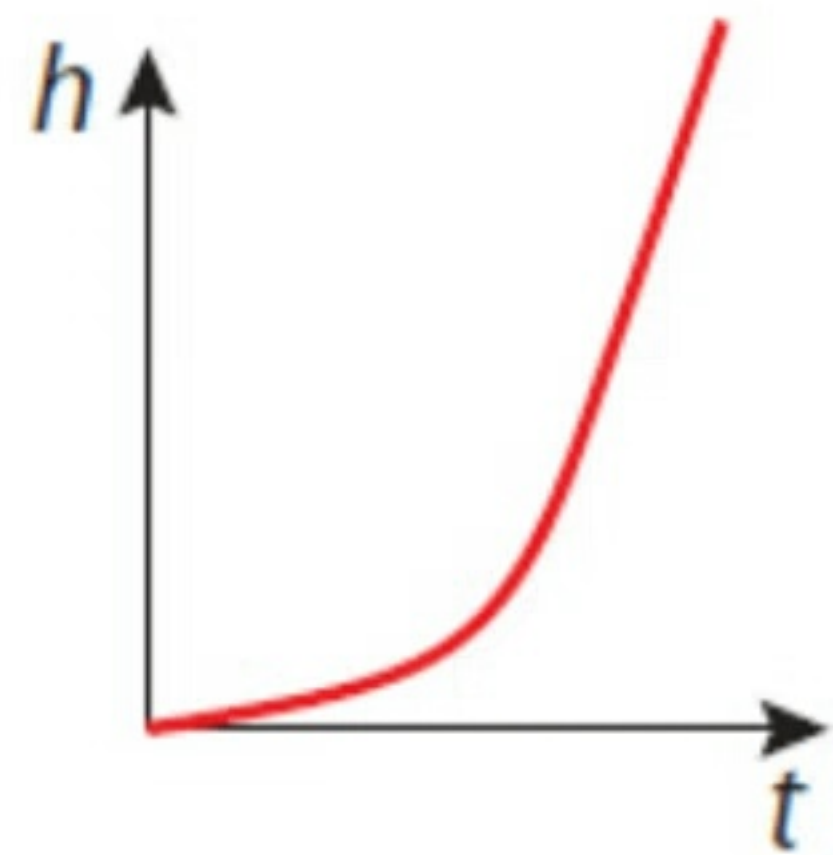
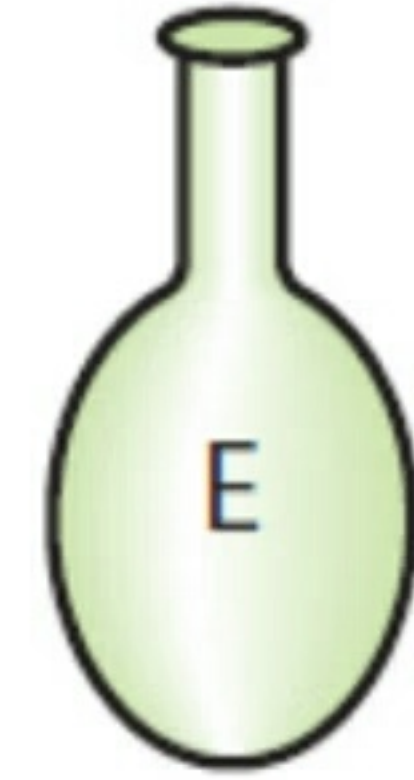
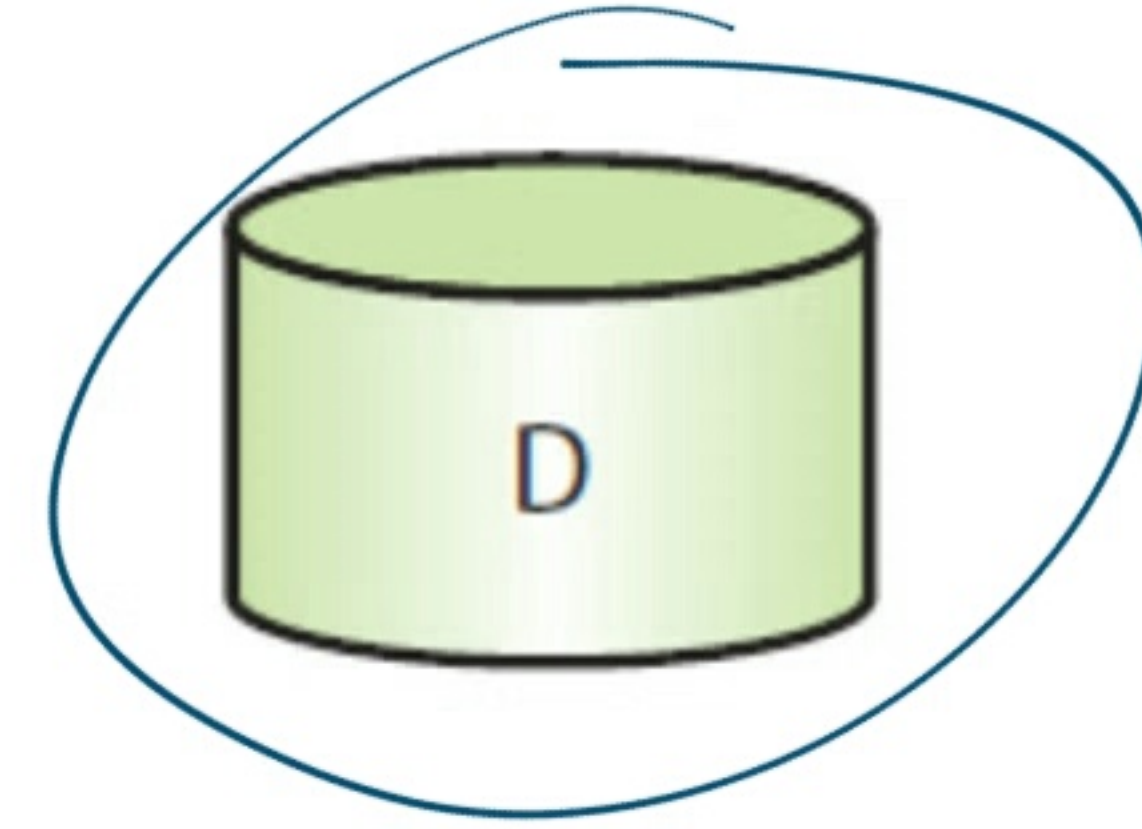
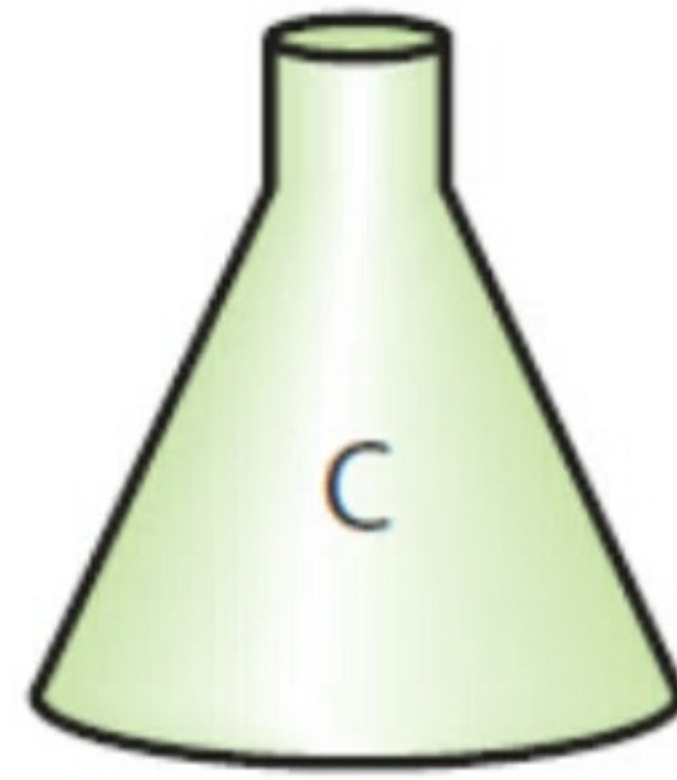
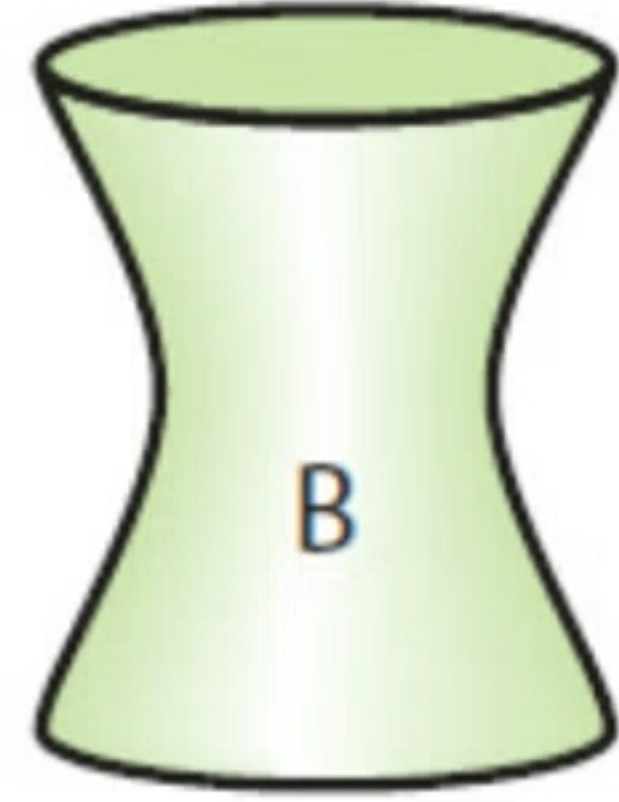
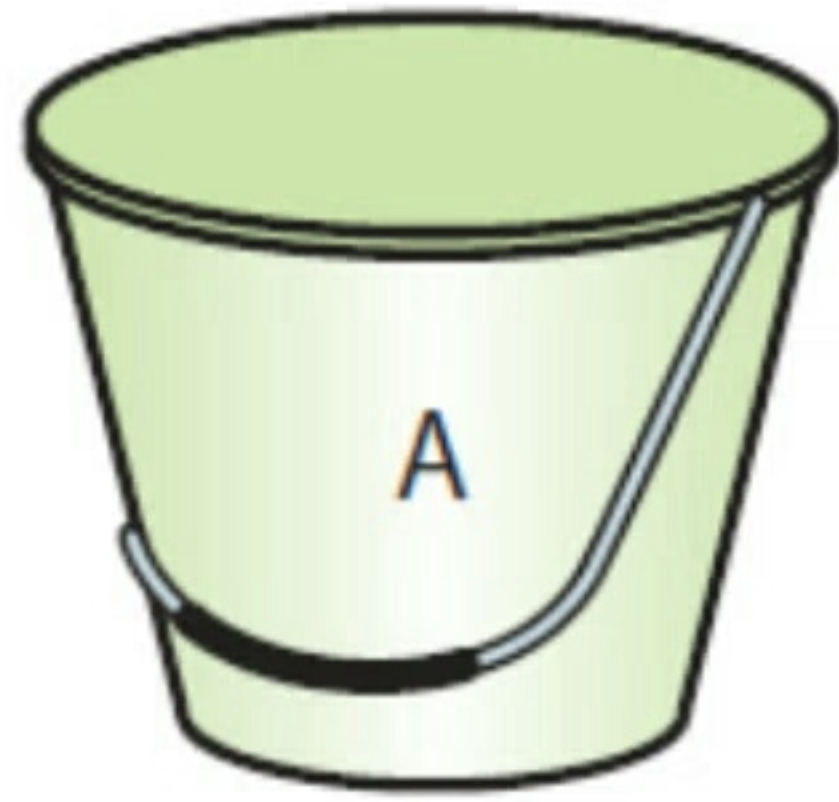
4. Match the graph to the story.



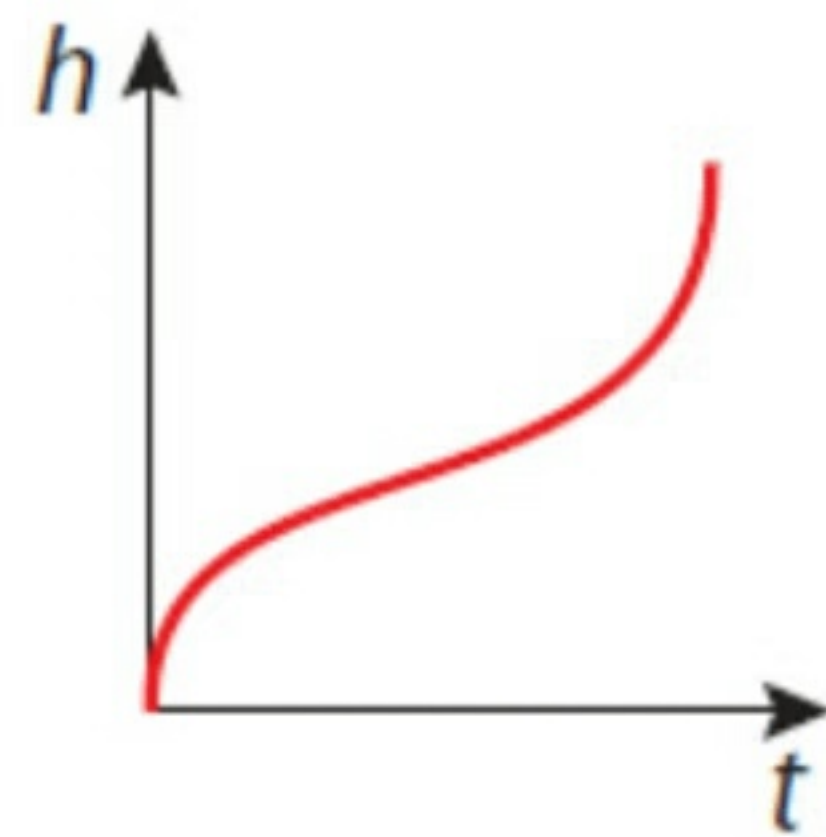
- (i) I fill a bucket with water. After a few minutes, my dog drinks some of the water. I decide to leave the water in the bucket in case he wants a drink later. ③
- (ii) I quickly fill a bucket with water but the bucket is spilt and the water runs out. ②
- (iii) I start with a full bucket of water and pour the water slowly over my seedlings until the bucket is empty. ①



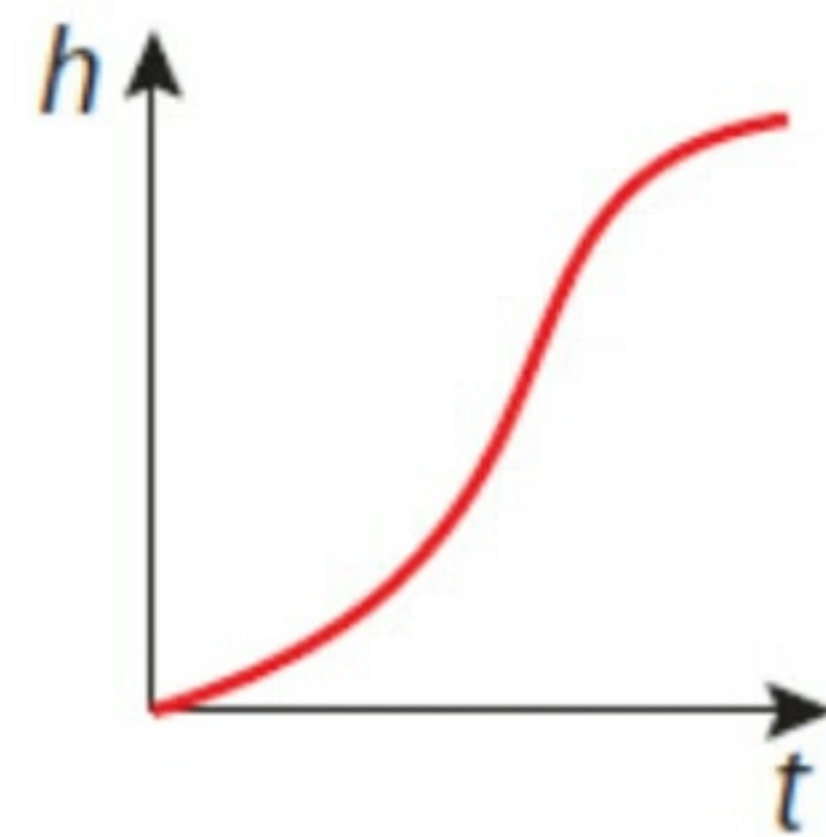
5. Liquid is poured at a constant rate into these five containers. The height,  $h$  cm, of the liquid in the containers is plotted against time,  $t$  seconds. Match these containers with their graphs.



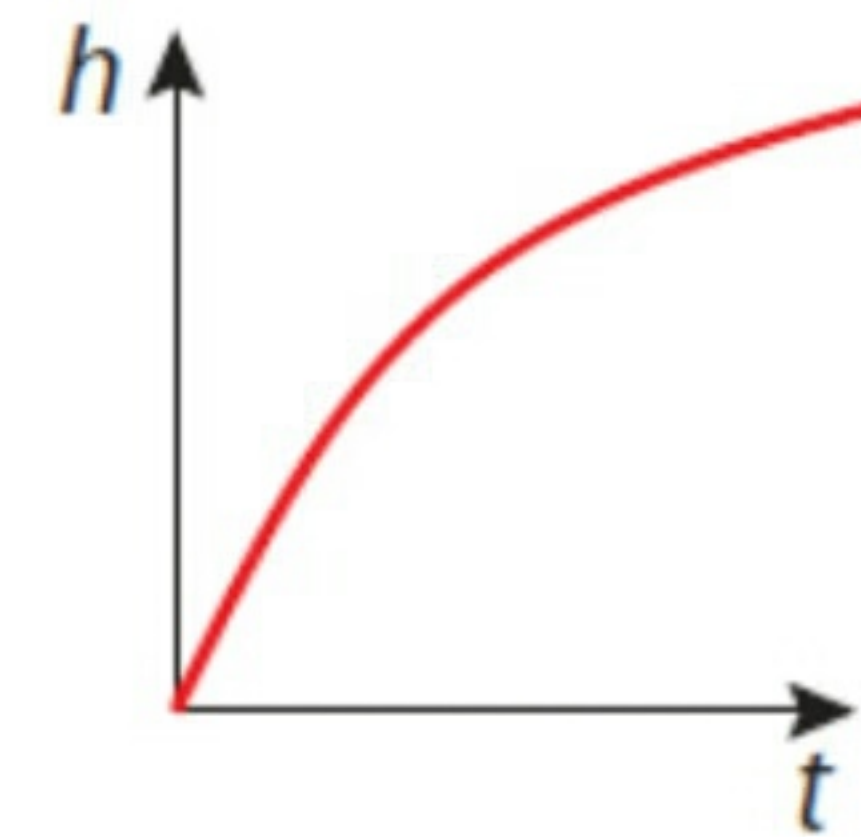
C = ①



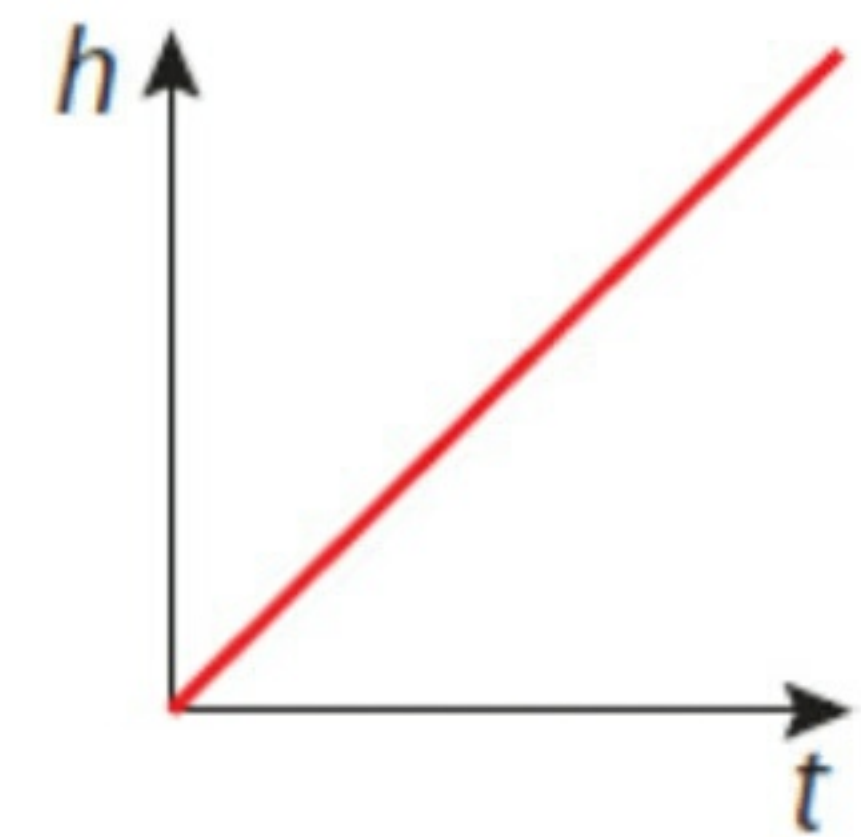
E = ②



B = ③

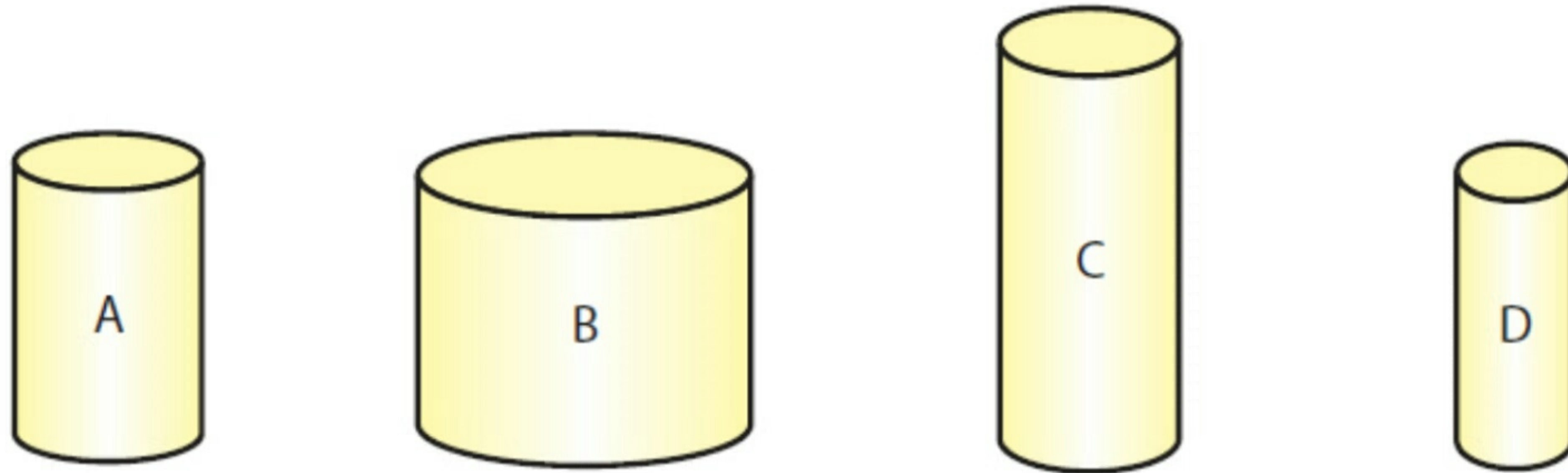


A = ④



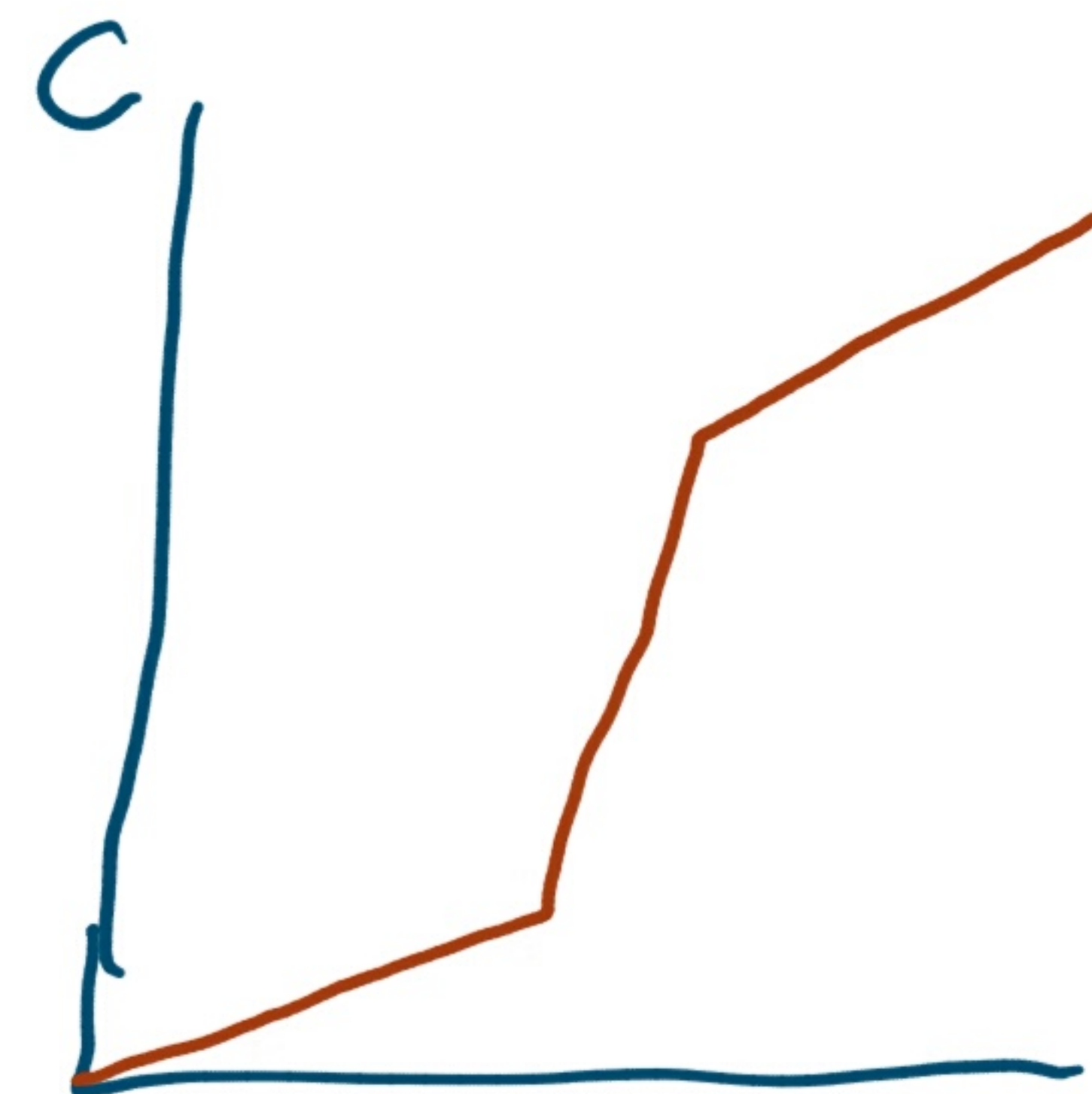
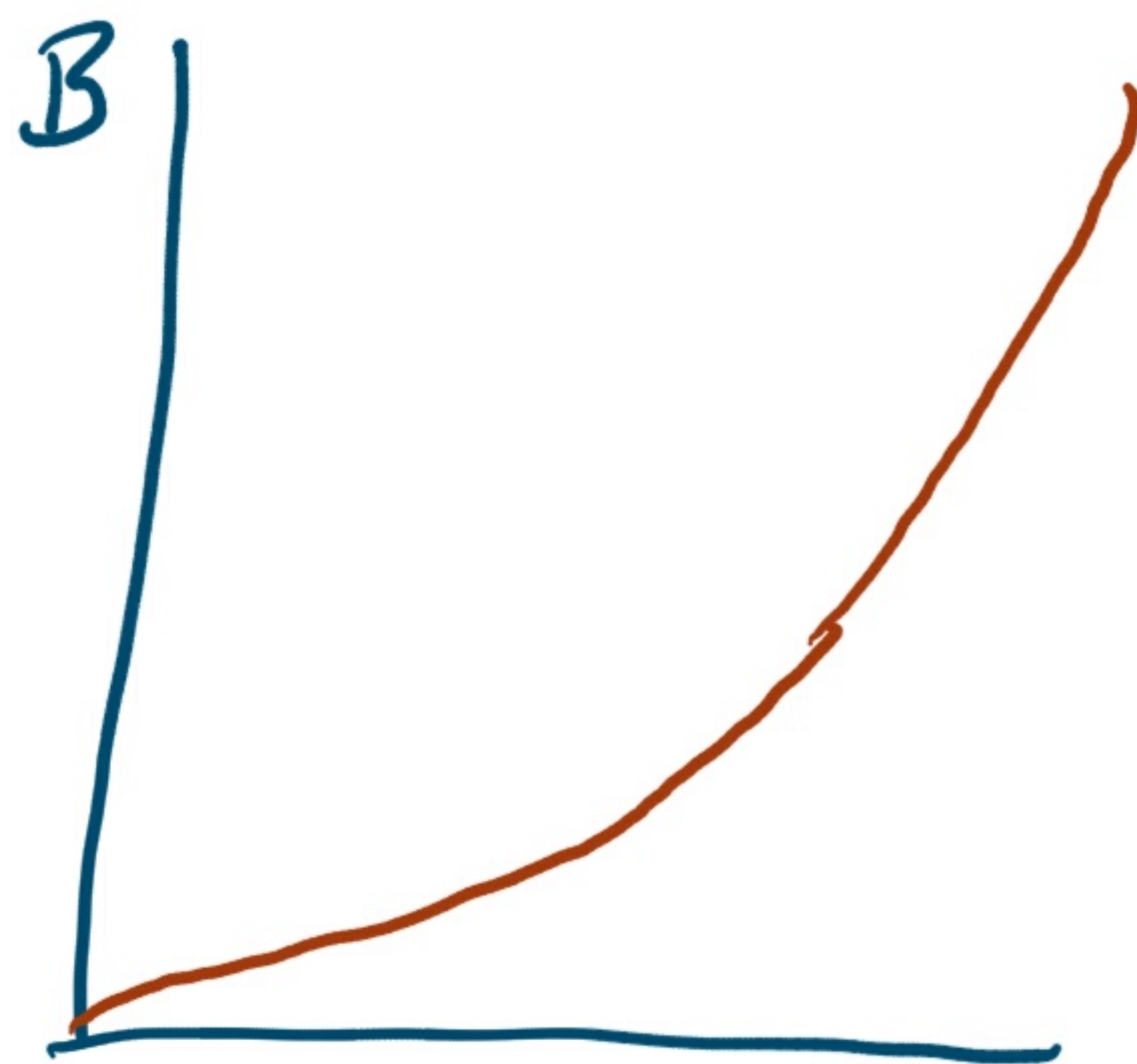
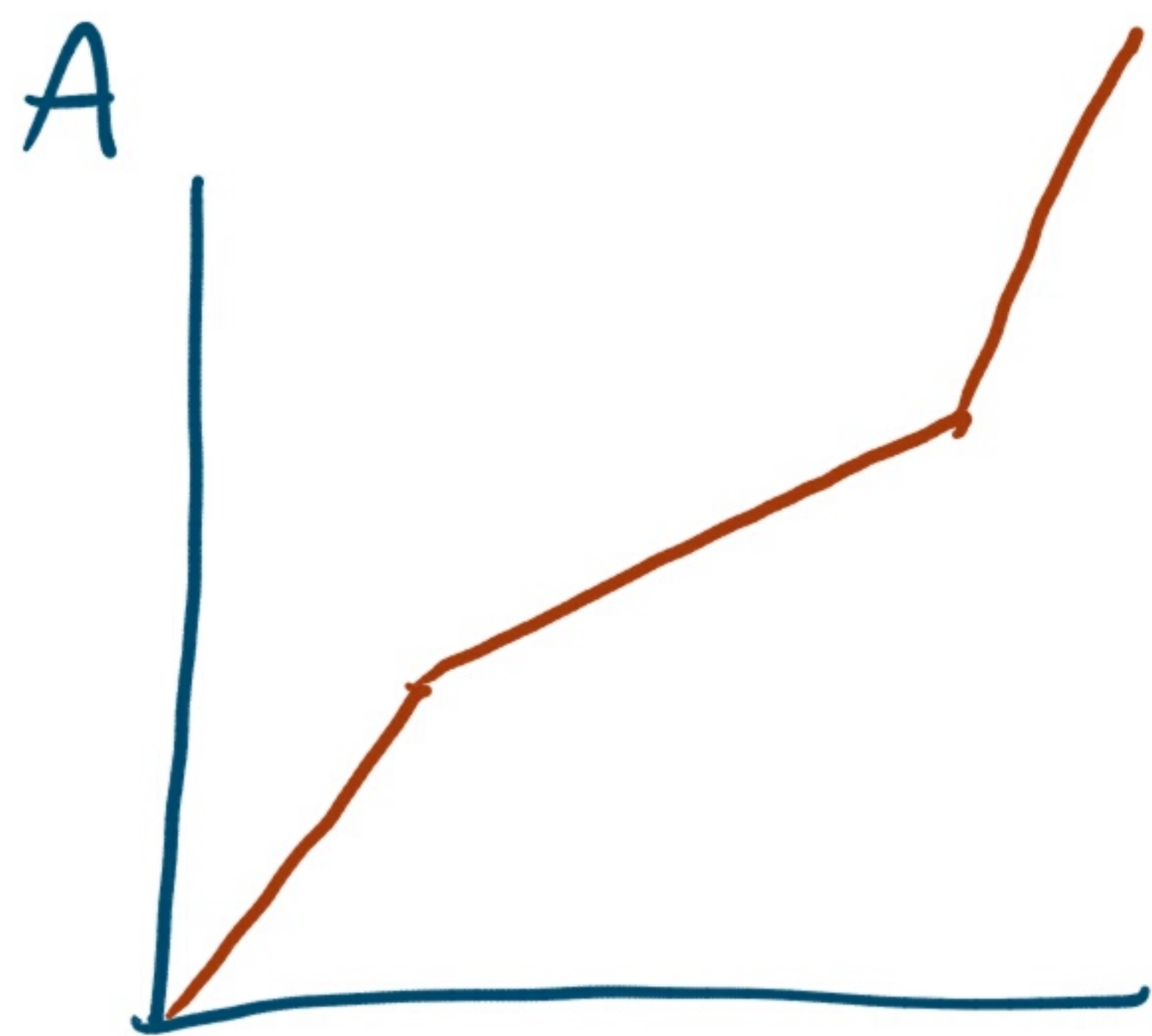
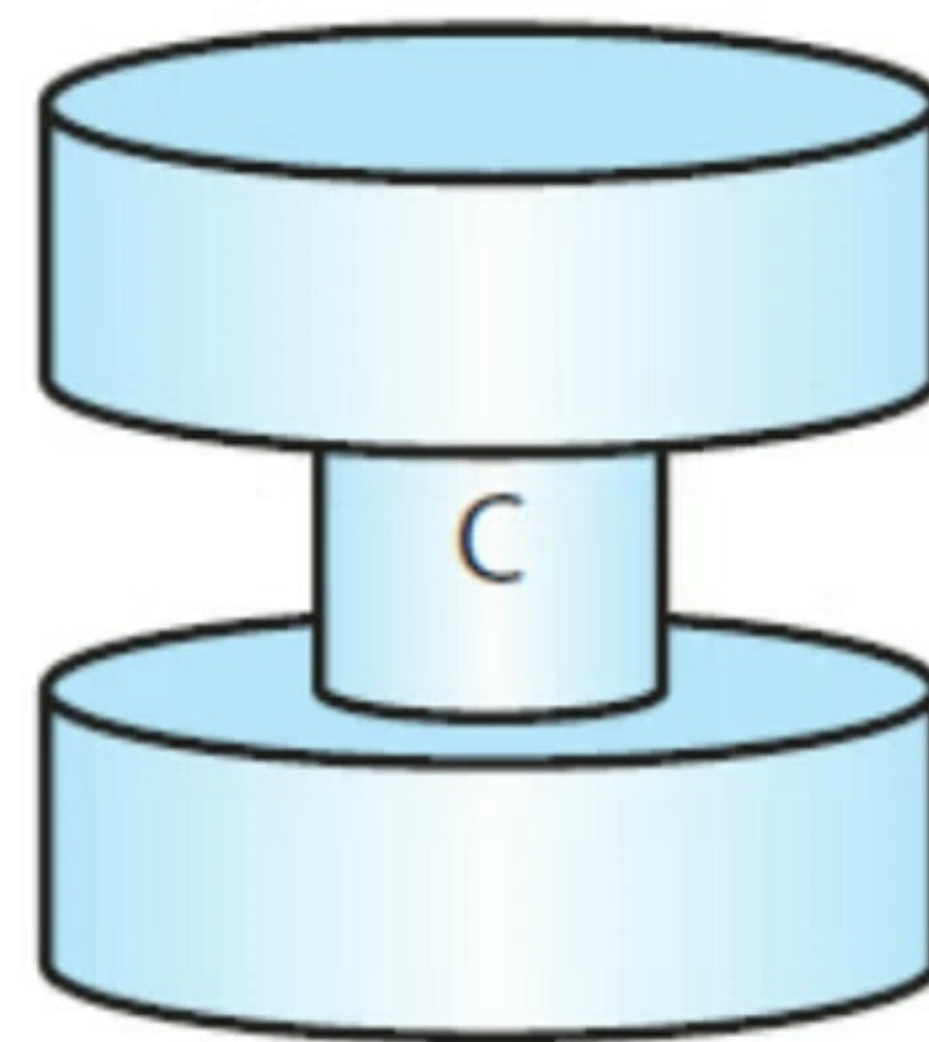
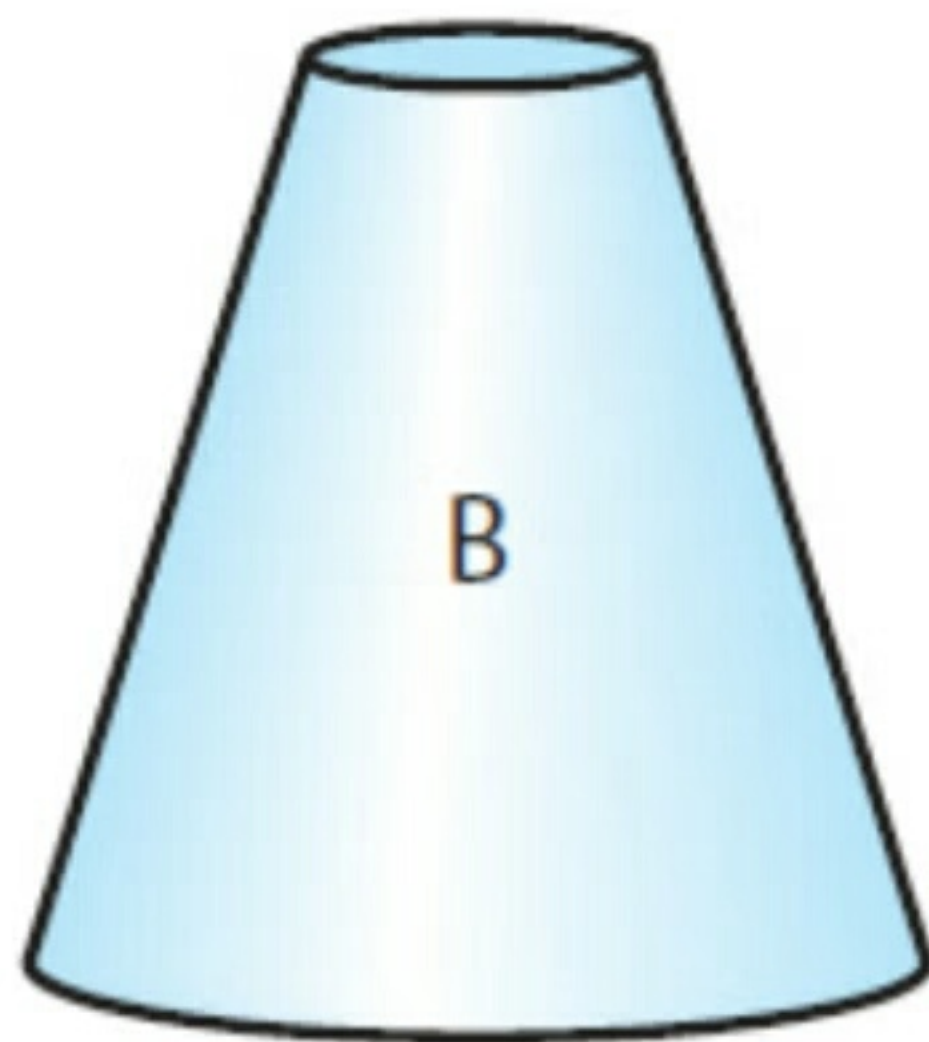
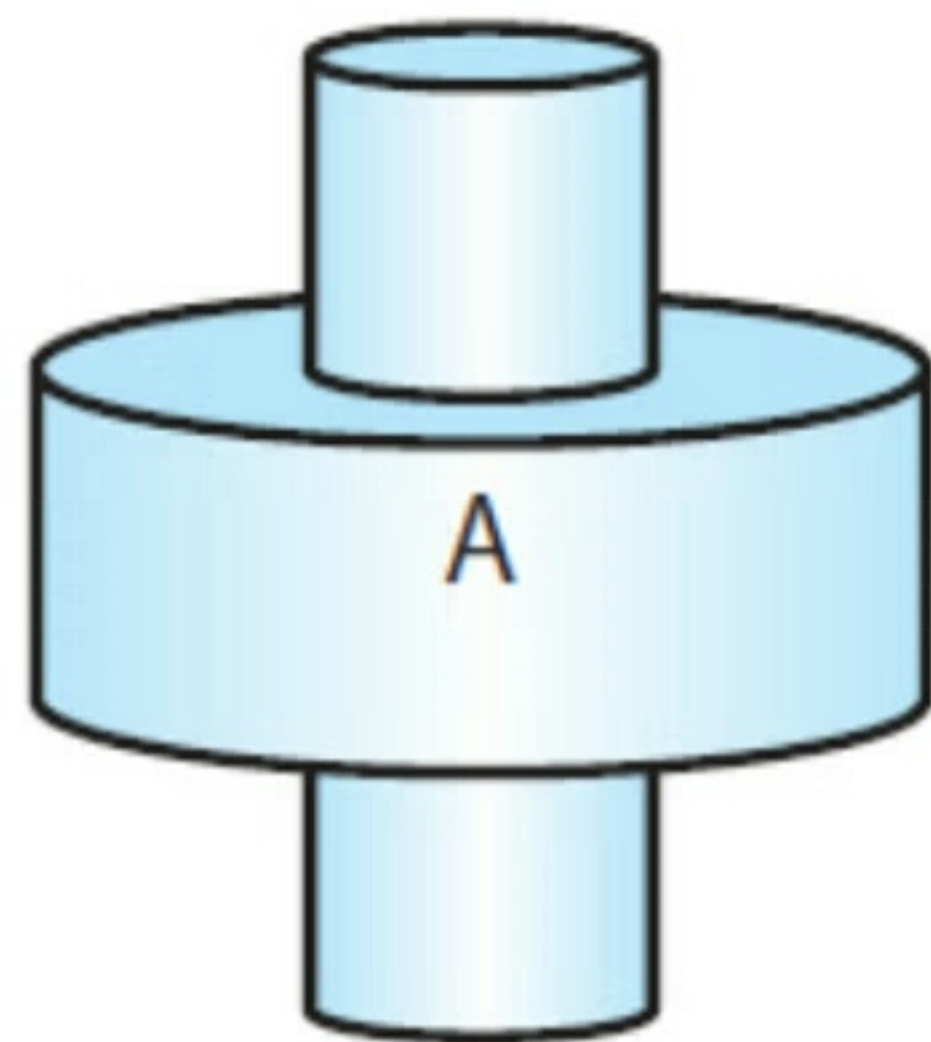
D = ⑤

6. Liquid is poured into each of these containers at a constant rate.  
Draw, for each container and on the same graph, the height of the liquid  $h$  against the time  $t$  in seconds.



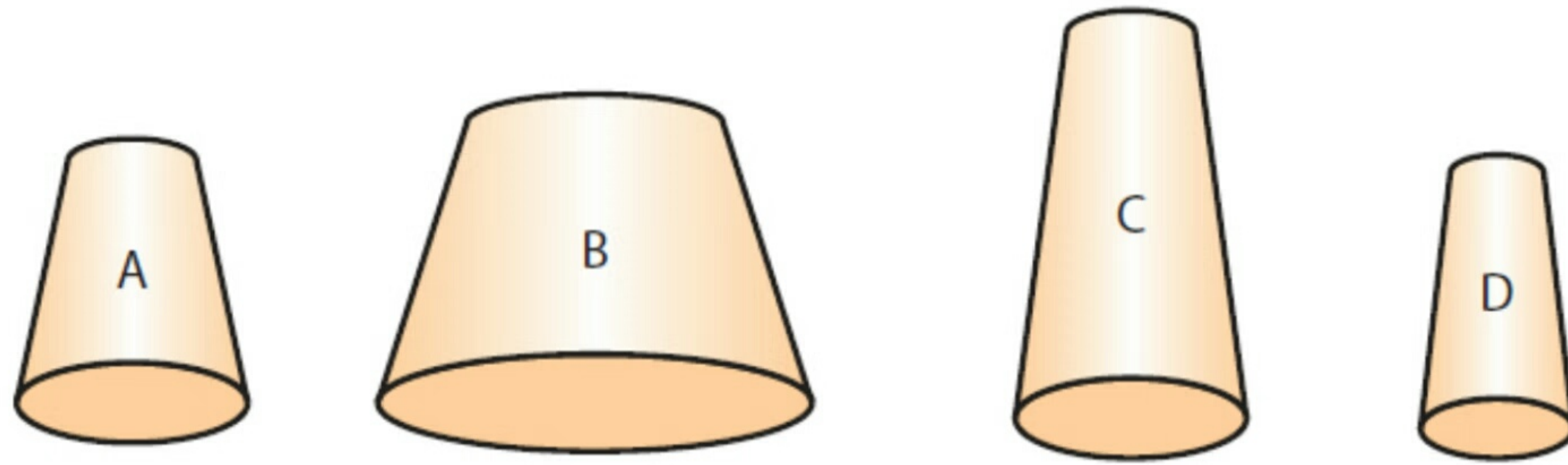
7. Here are three containers.

For each one, sketch a graph showing how it fills up with water.



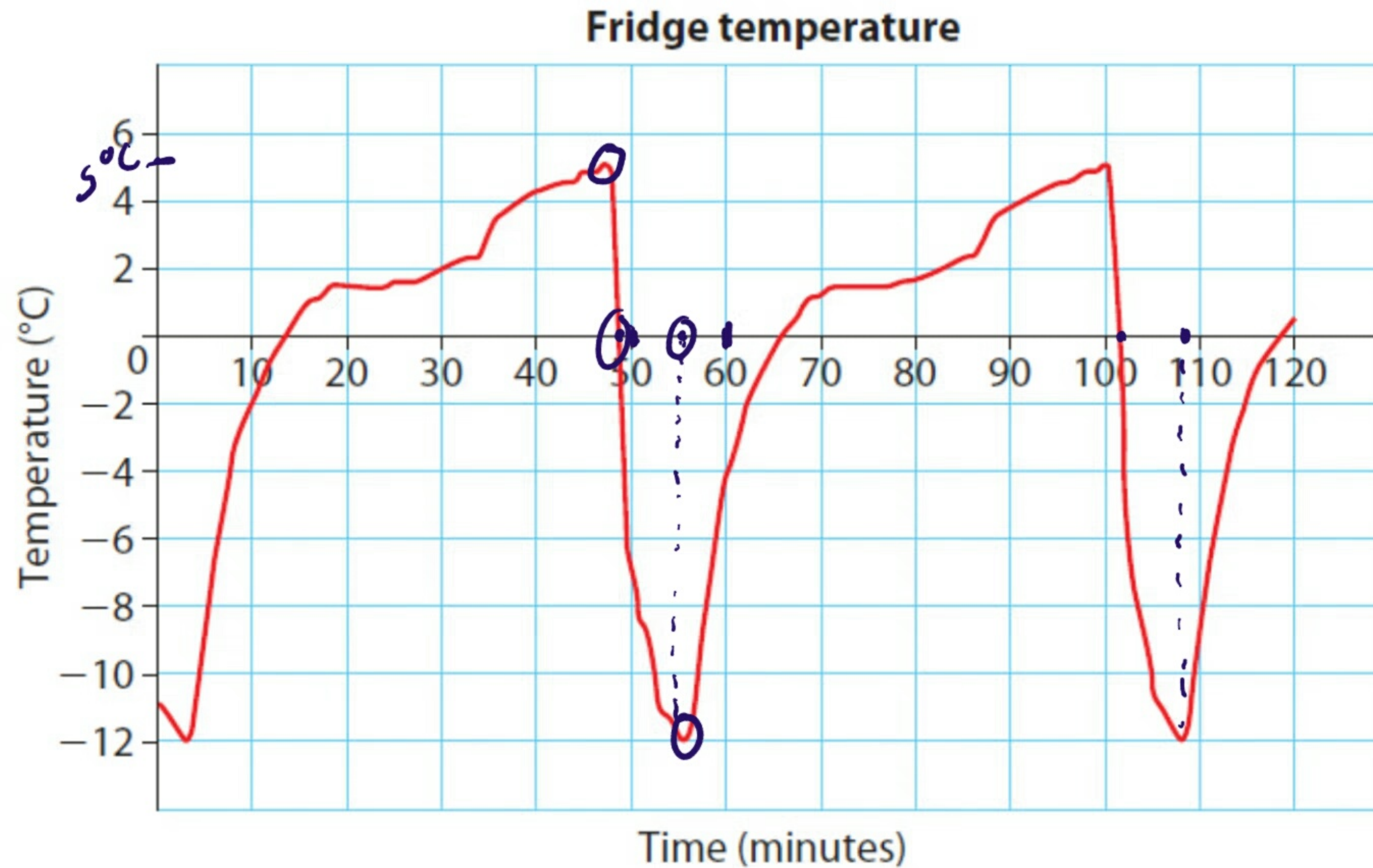
**8.** Liquid is poured into each of these receptacles at a constant rate.

Draw, on the same graph, the height of the liquid  $h$ , against time  $t$ , in seconds.



HW<sup>9</sup>.

The graph shows the temperature inside a new fridge.  
The temperature was taken every minute over a two-hour period.

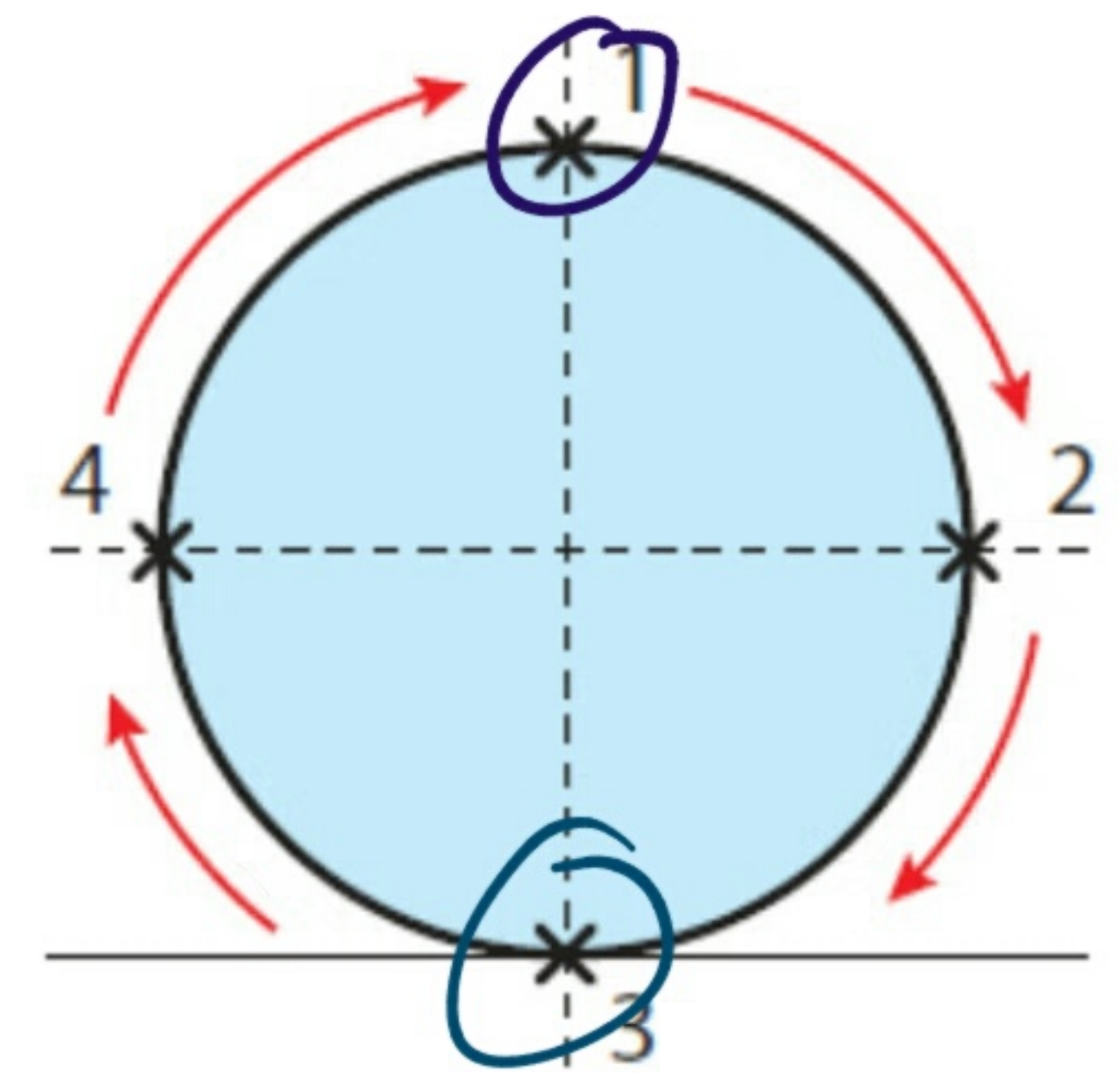


The fridge has a motor which cools down the inside.

The motor is switched on and off by a thermostat.

- What happens to the temperature in the fridge when the motor is running? Drops
- At what temperature does the thermostat switch the motor on?  $5^{\circ}\text{C}$
- What happens to the temperature when the motor is not running? Rise
- At what temperature does the thermostat switch the motor off?  $-12^{\circ}\text{C}$
- For about how long does the motor run each time it is switched on?

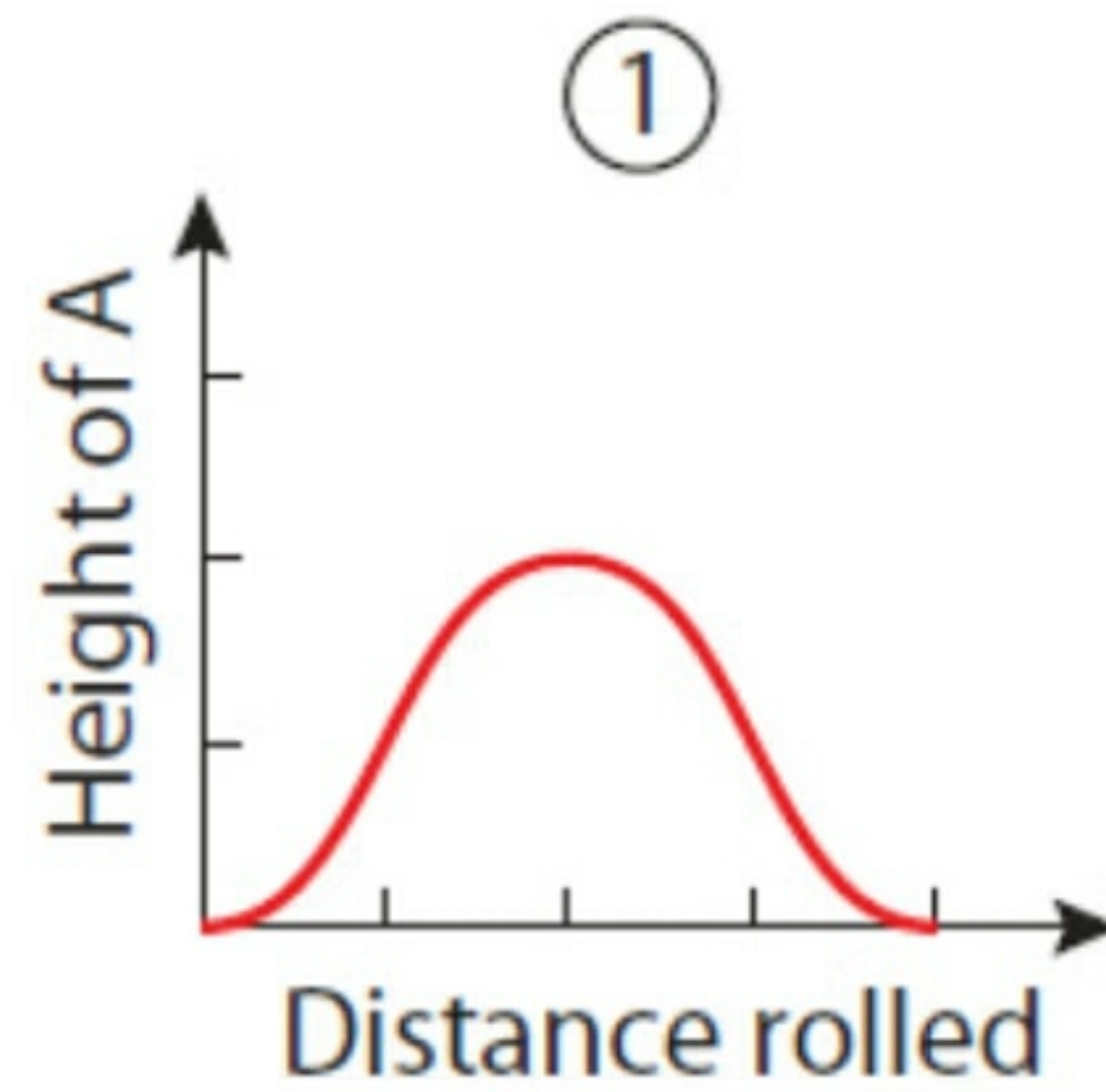
**10.** A point  $A$  is on the circumference of a wheel. The wheel completes one revolution where the starting position of  $A$  can be at any of the points 1, 2, 3 or 4 marked in the diagram on the right.



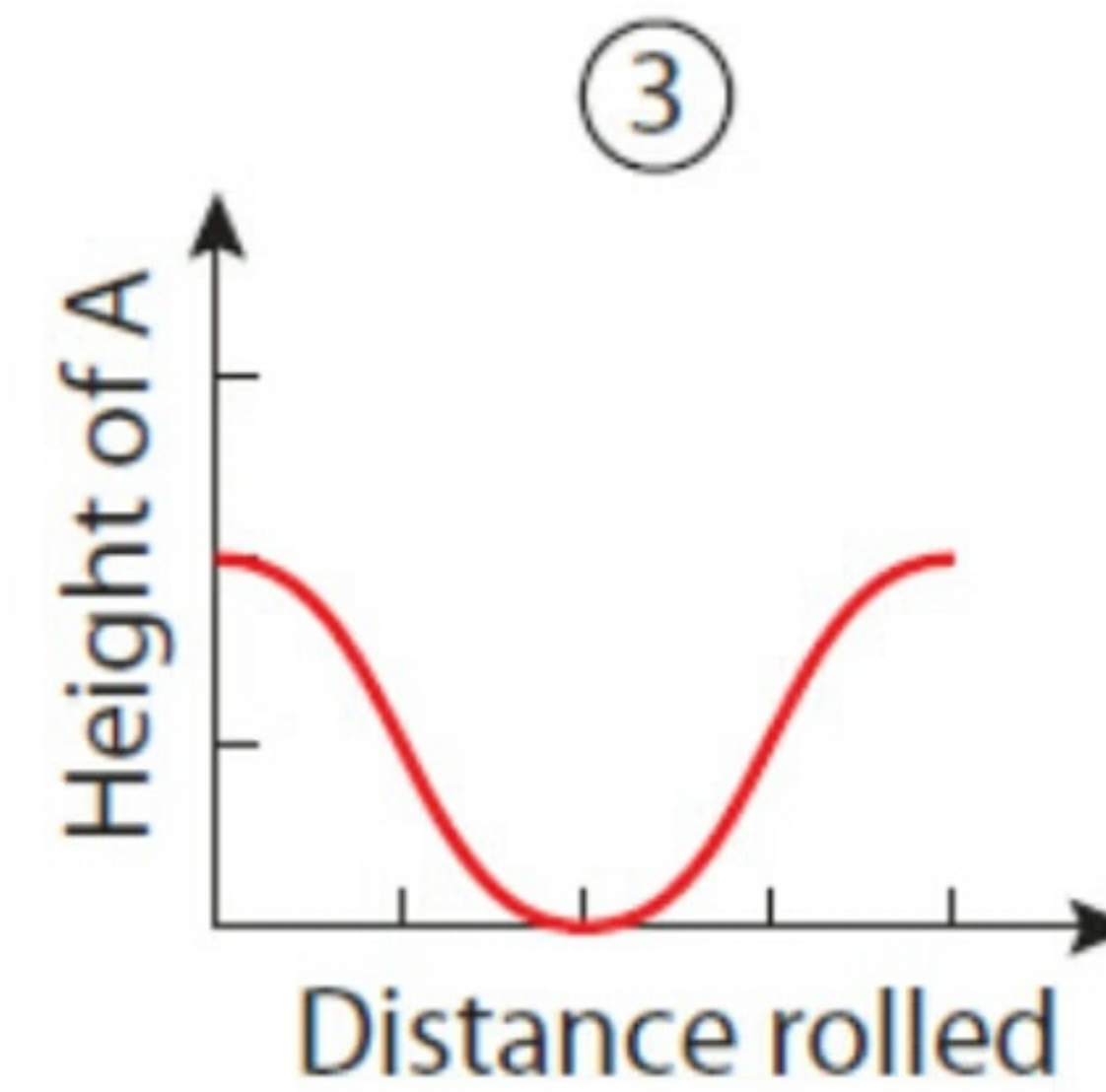
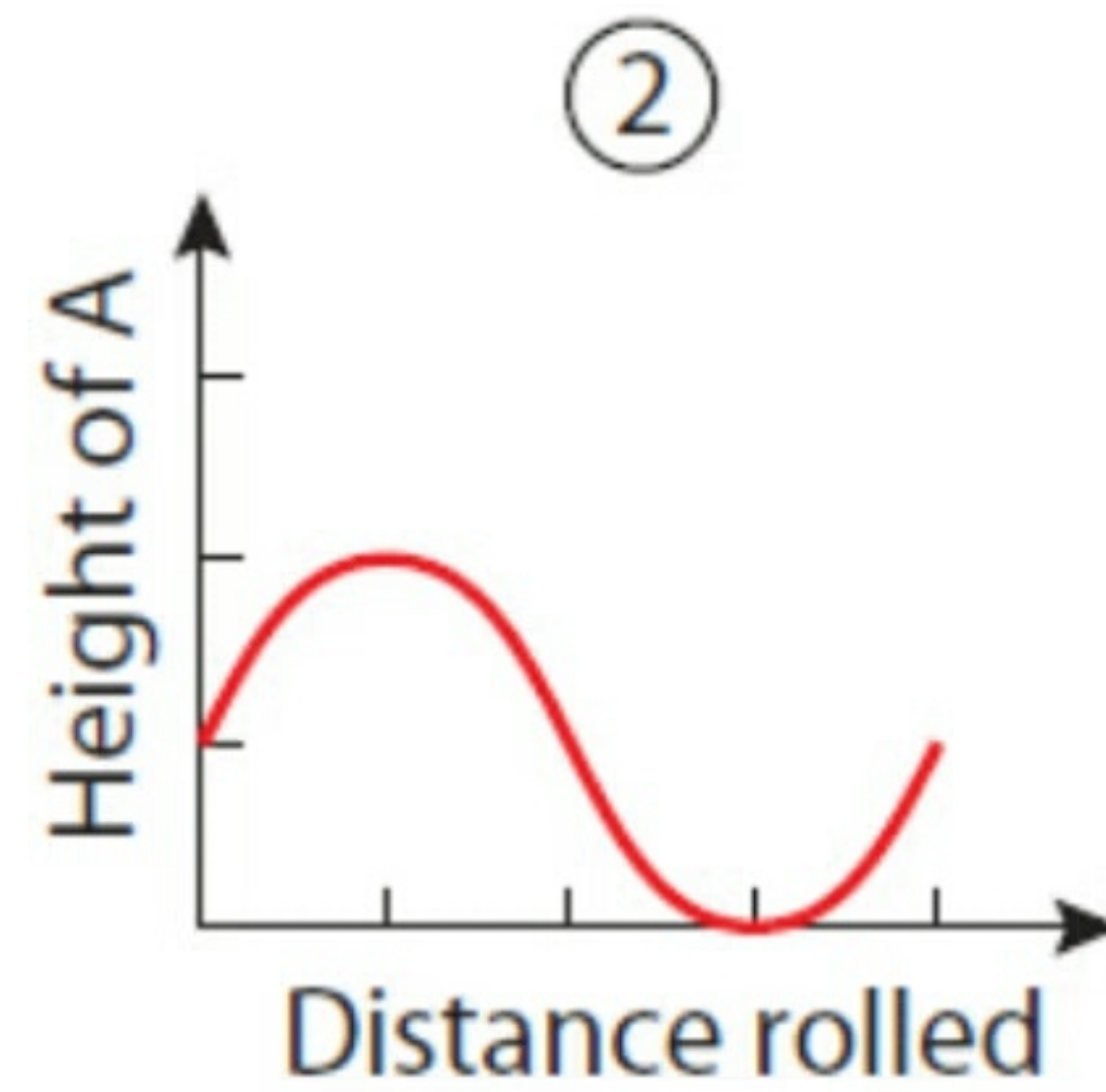
Which one of the graphs below best represents the height of  $A$  above the ground when  $A$  starts at:

- (i) position <sup>3</sup>1    (ii) position 3    (iii) position 2?

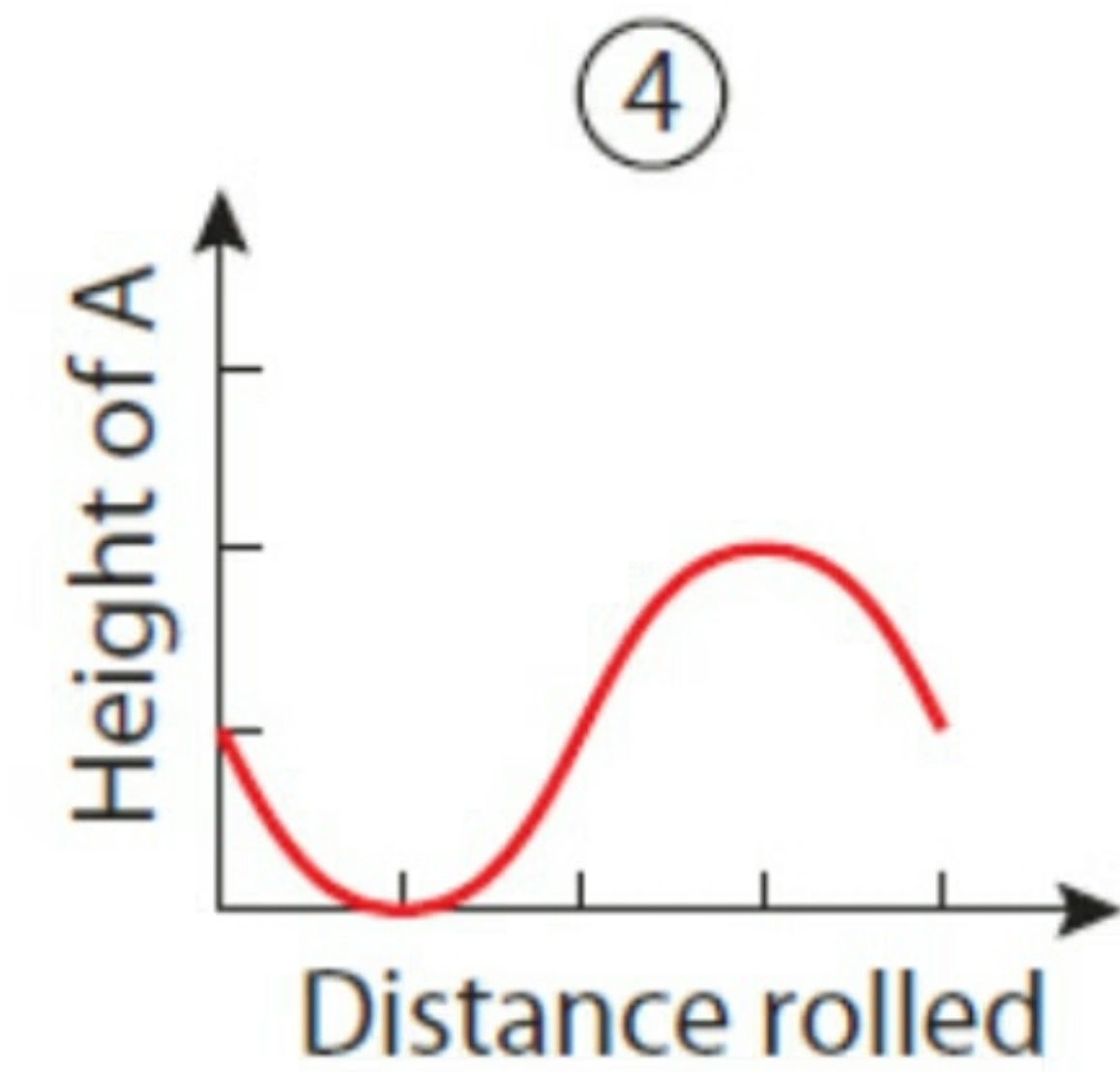
**Note:** You will need to know that the wheel is rolled from left to right.



③

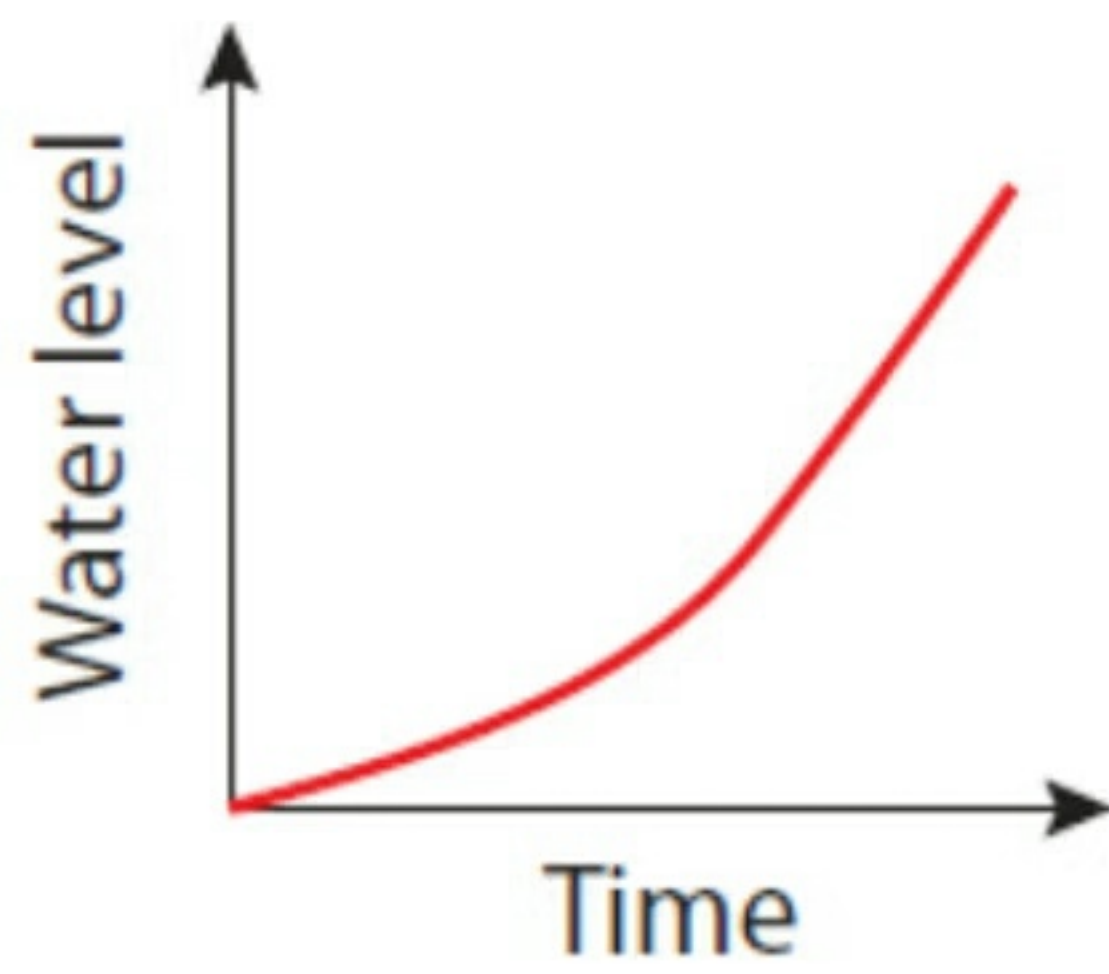
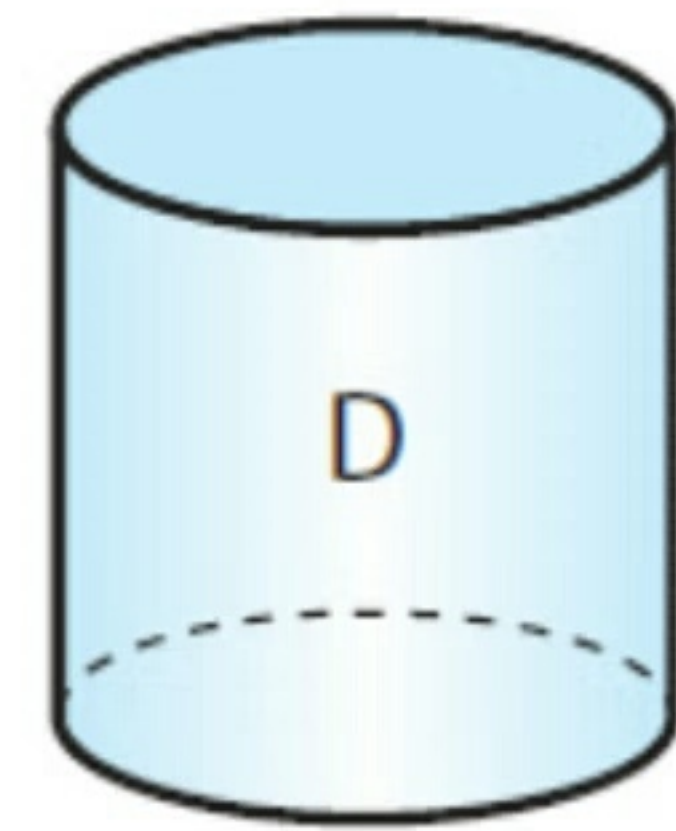
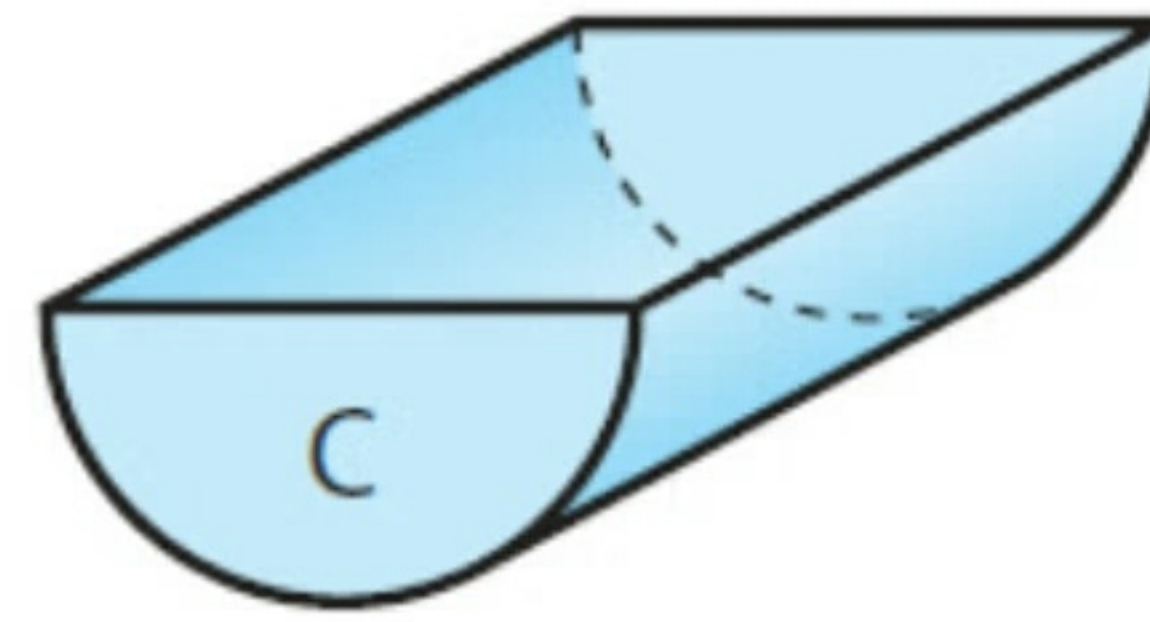
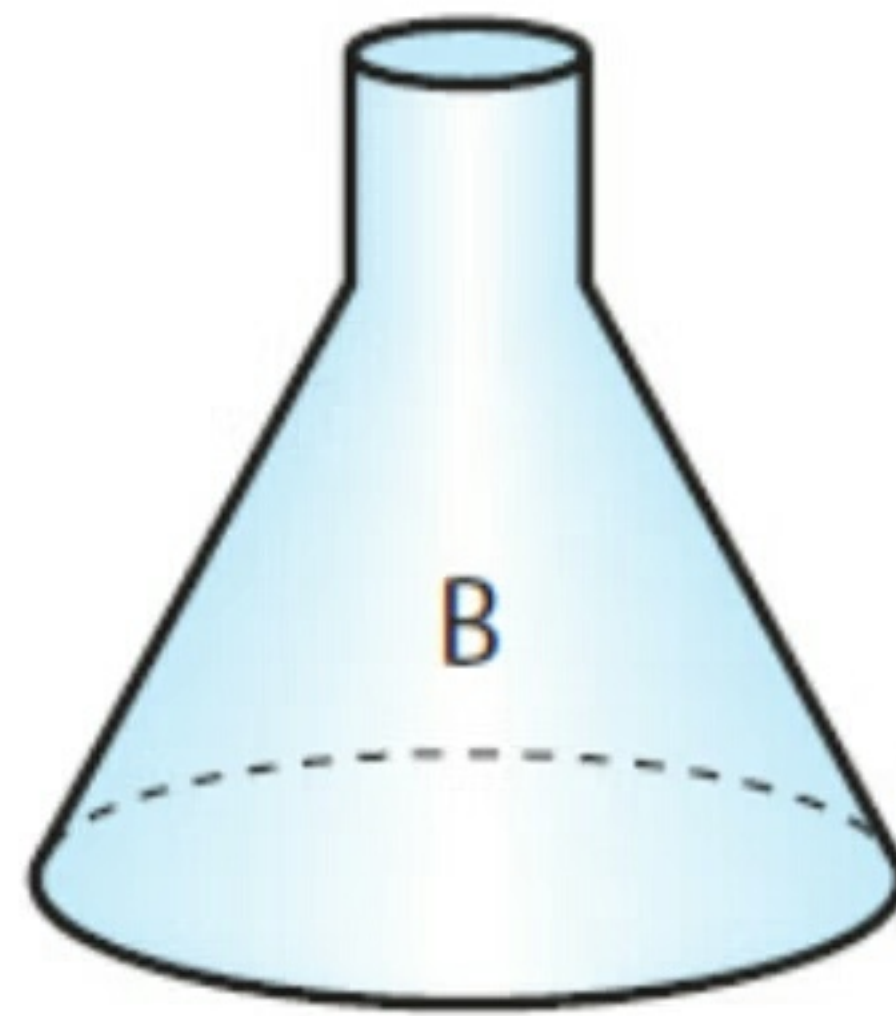
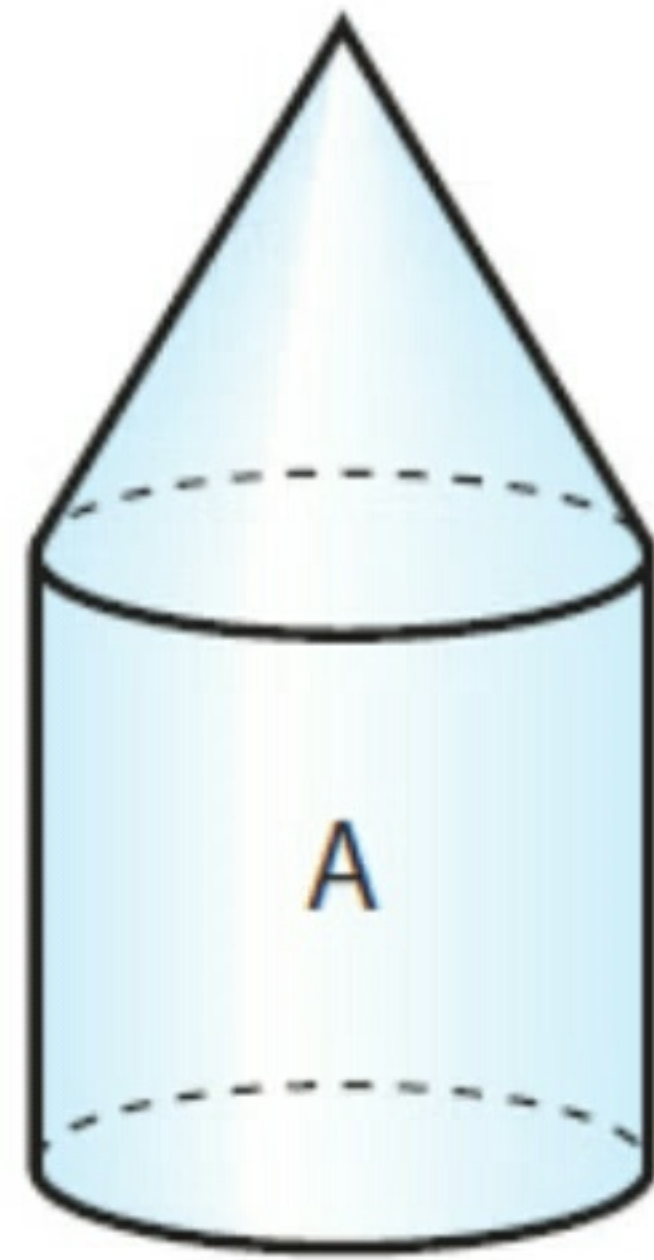


①



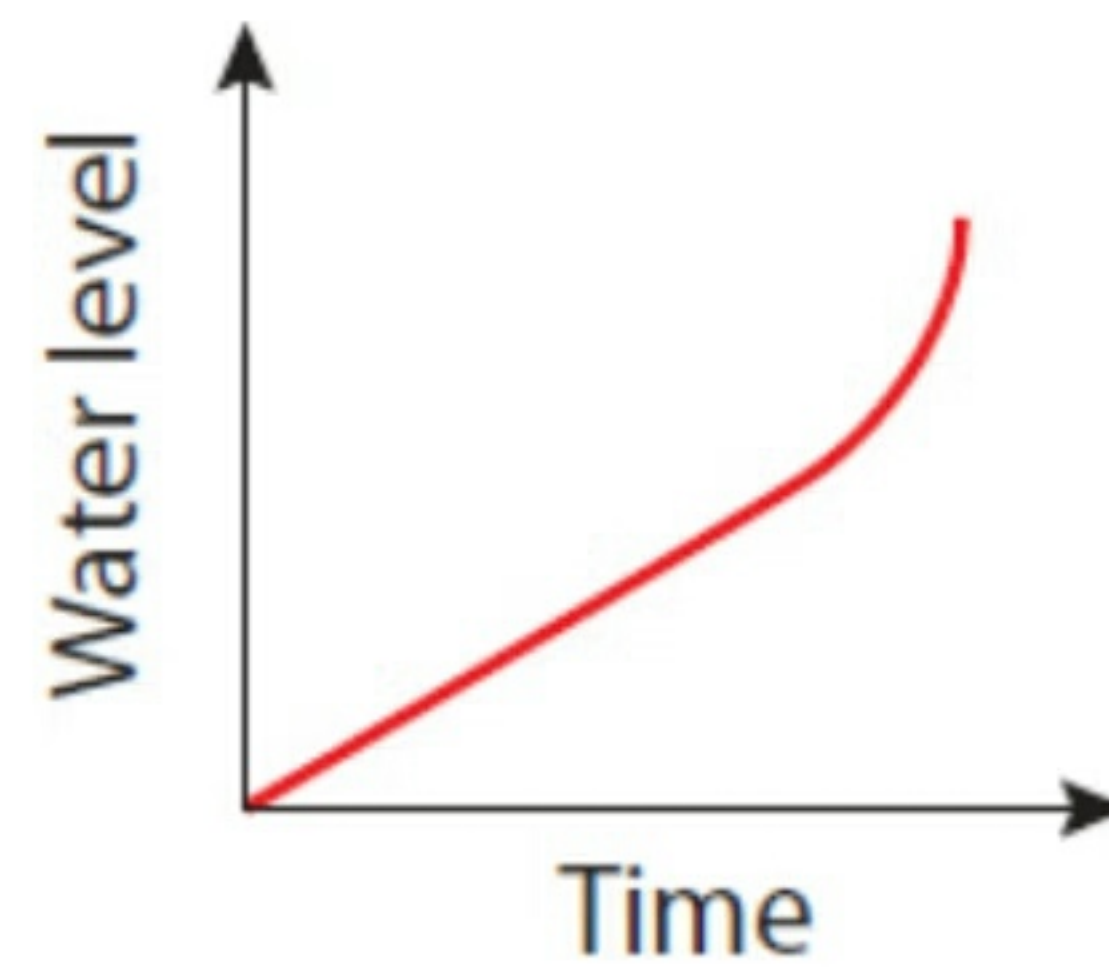
④

- 11.** Each of the four containers pictured is filled with water at a steady rate. When the level of water in each container was plotted, the graphs ① to ④ were obtained. Match each container to its graph.



①

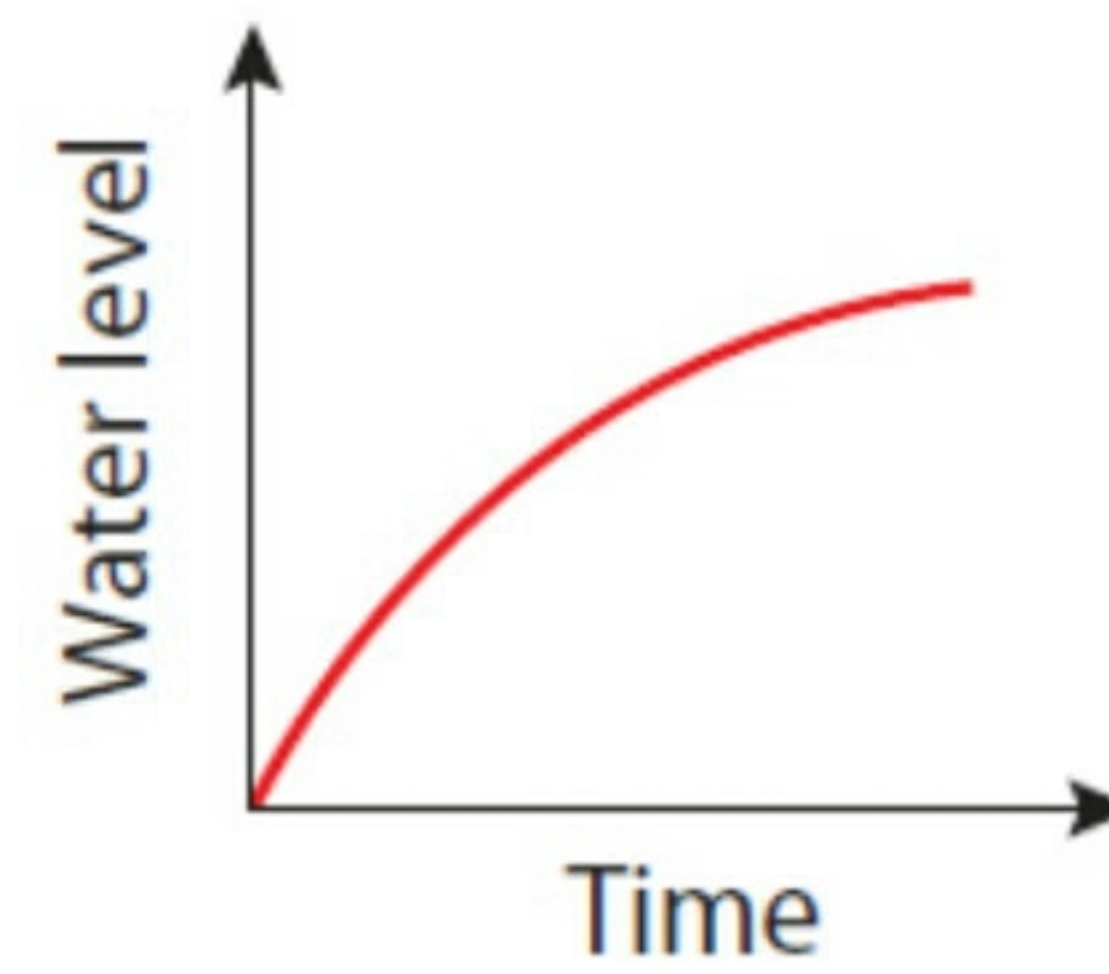
B



Time

②

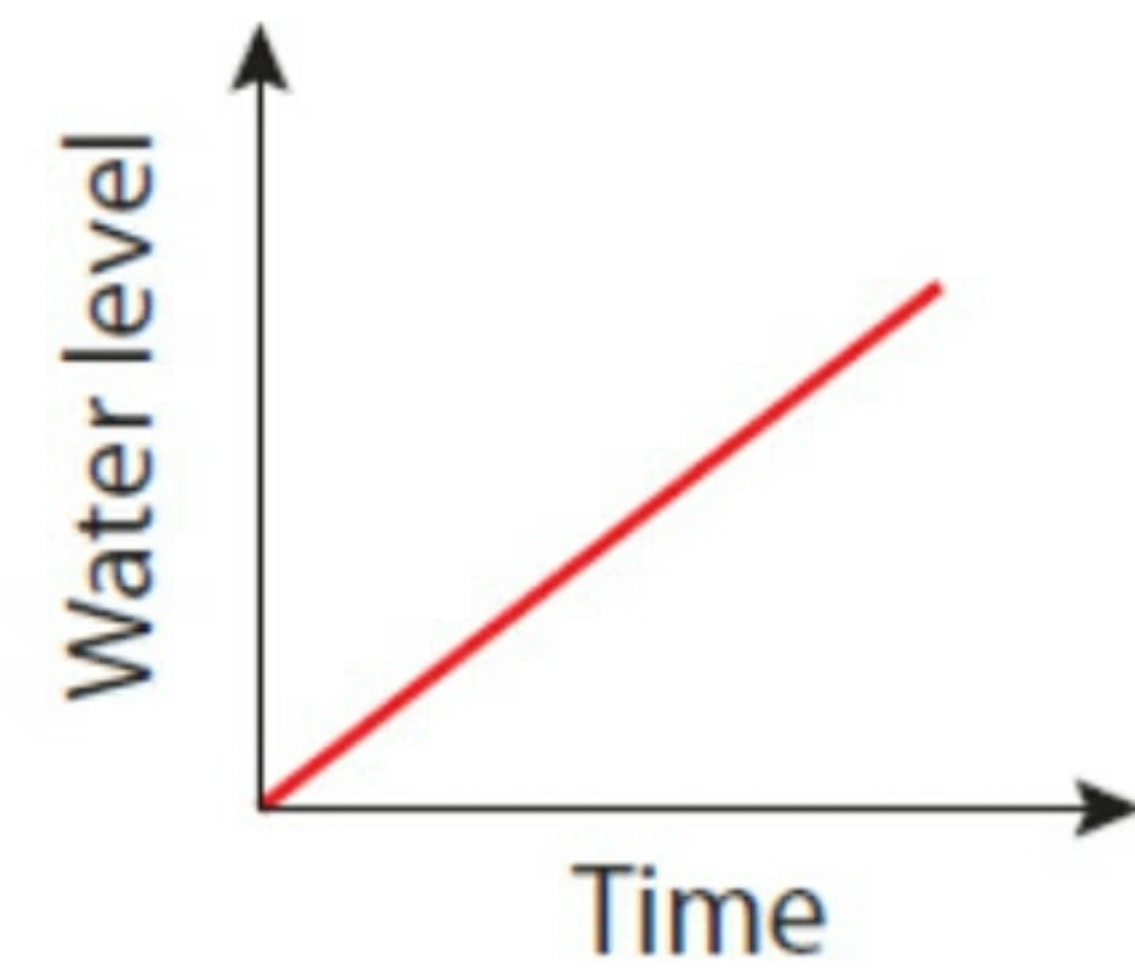
A



Time

③

C



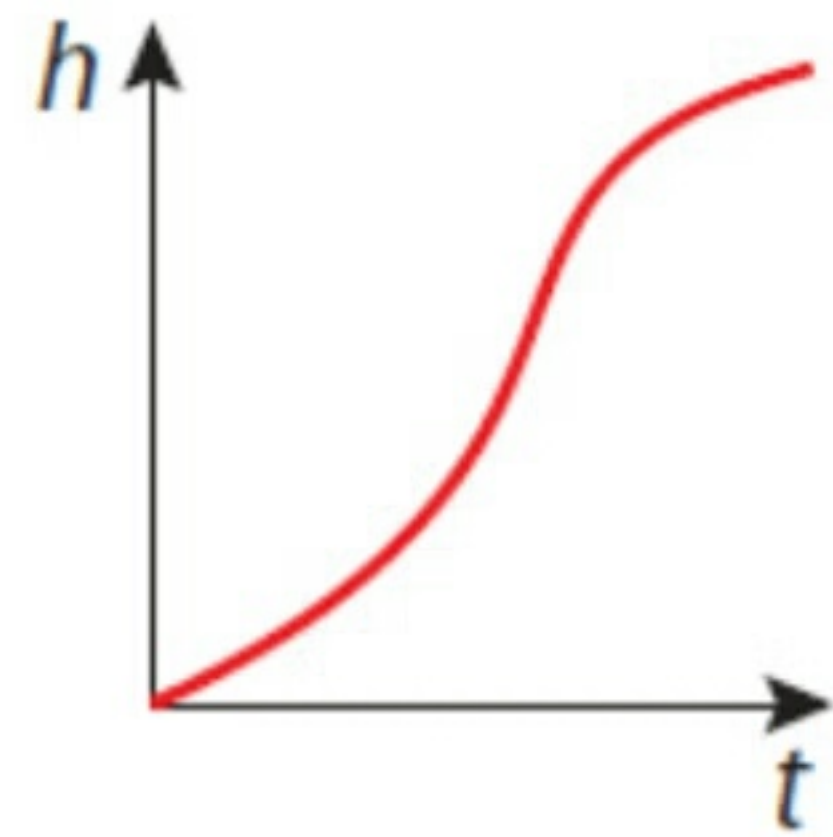
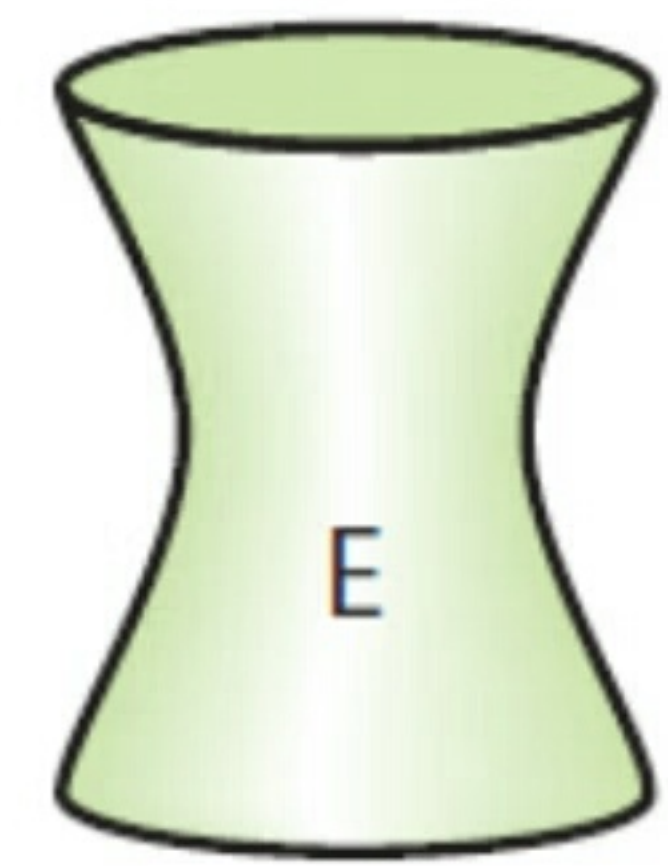
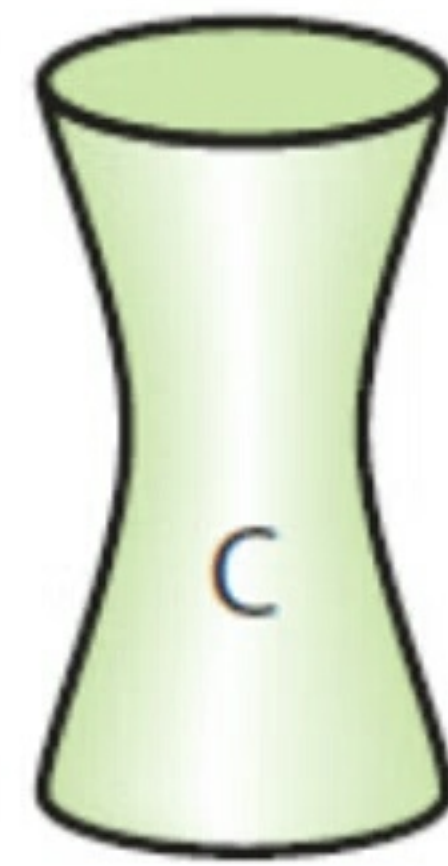
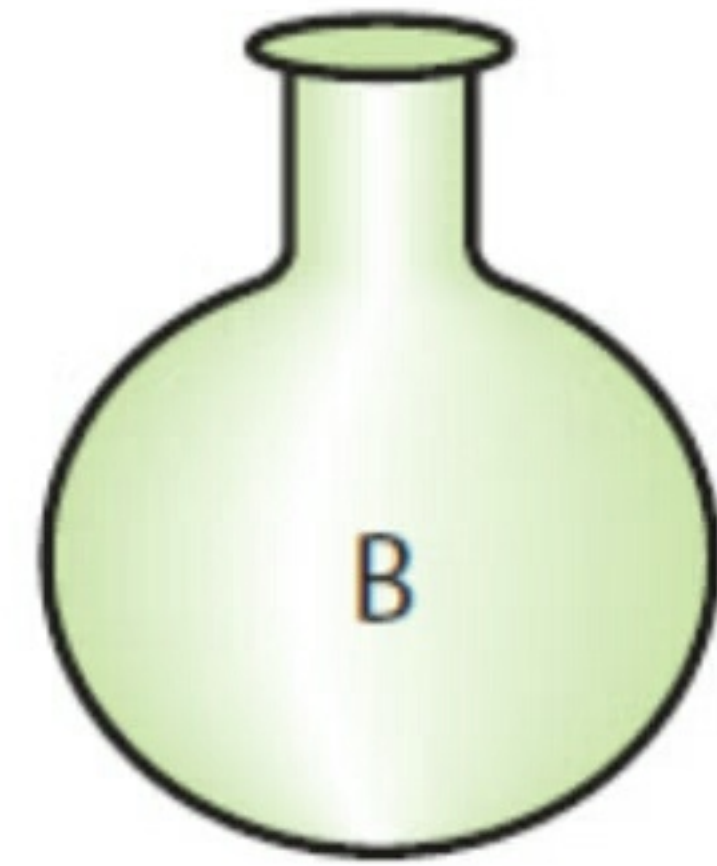
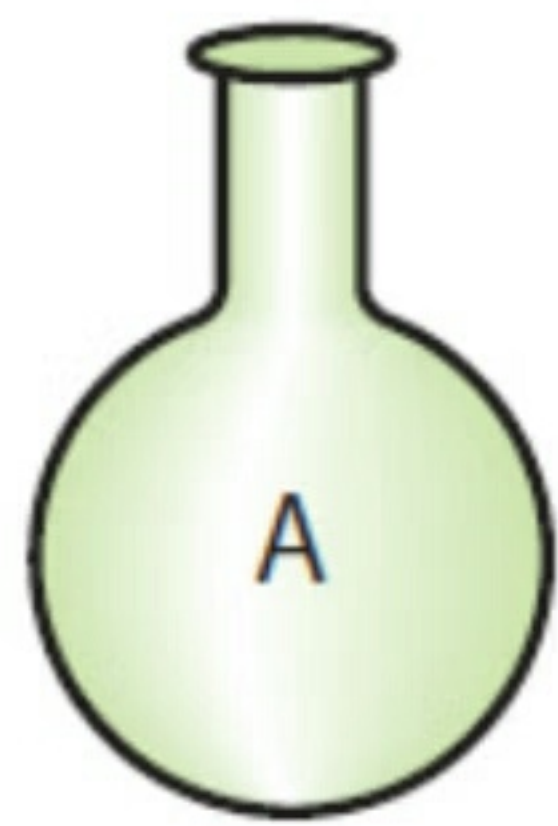
Time

④

D

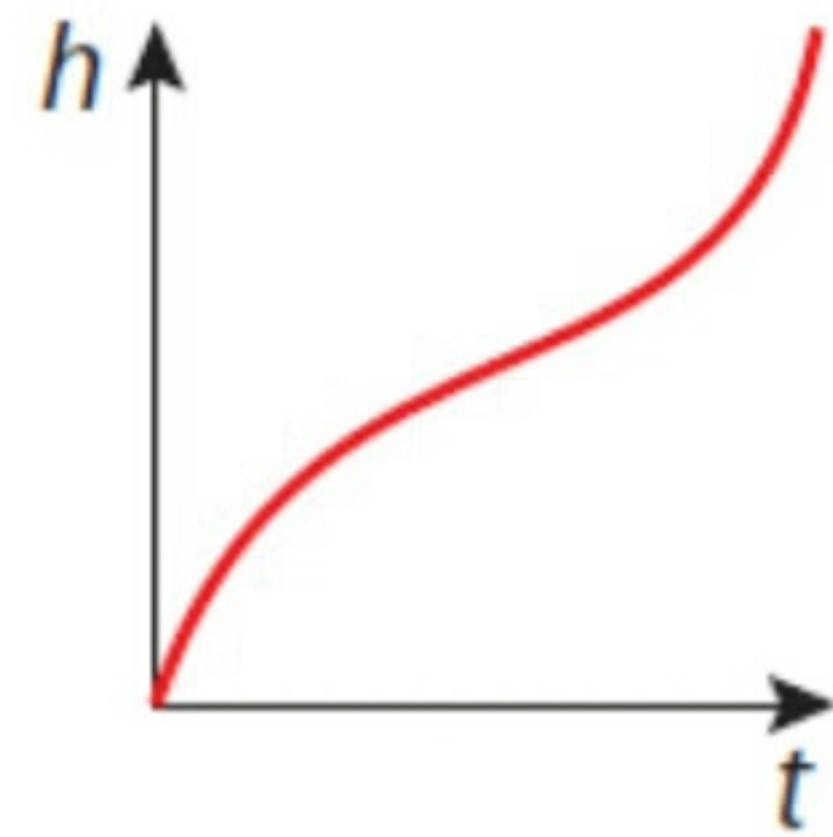
**12.** Each of these containers is filled with water at a steady rate.

If the graphs represent the rise in the level of the water, match each container to its graph.



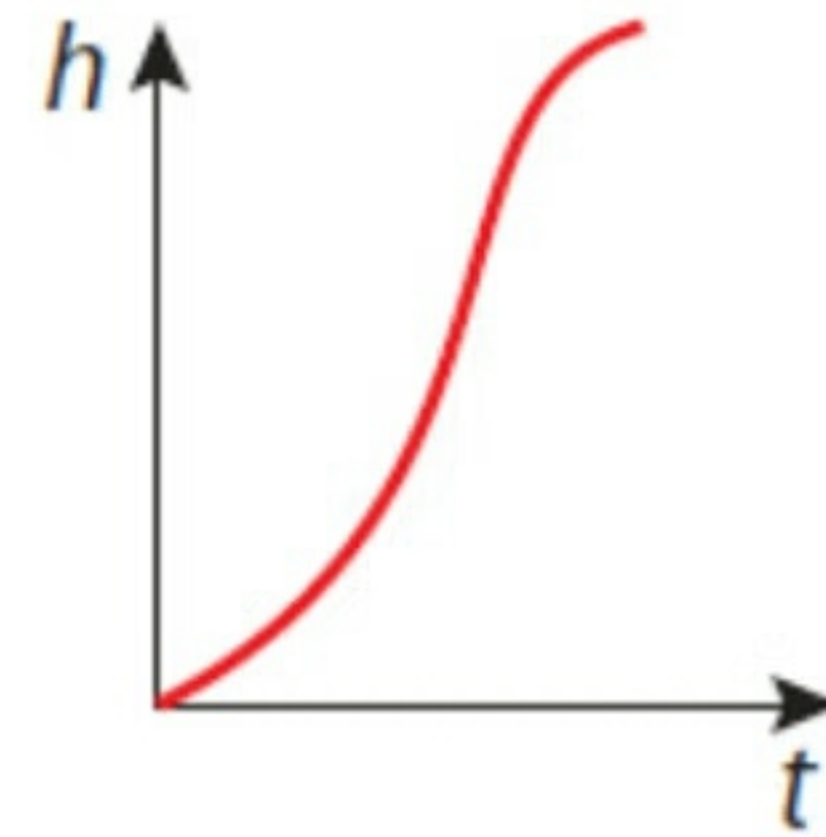
①

E



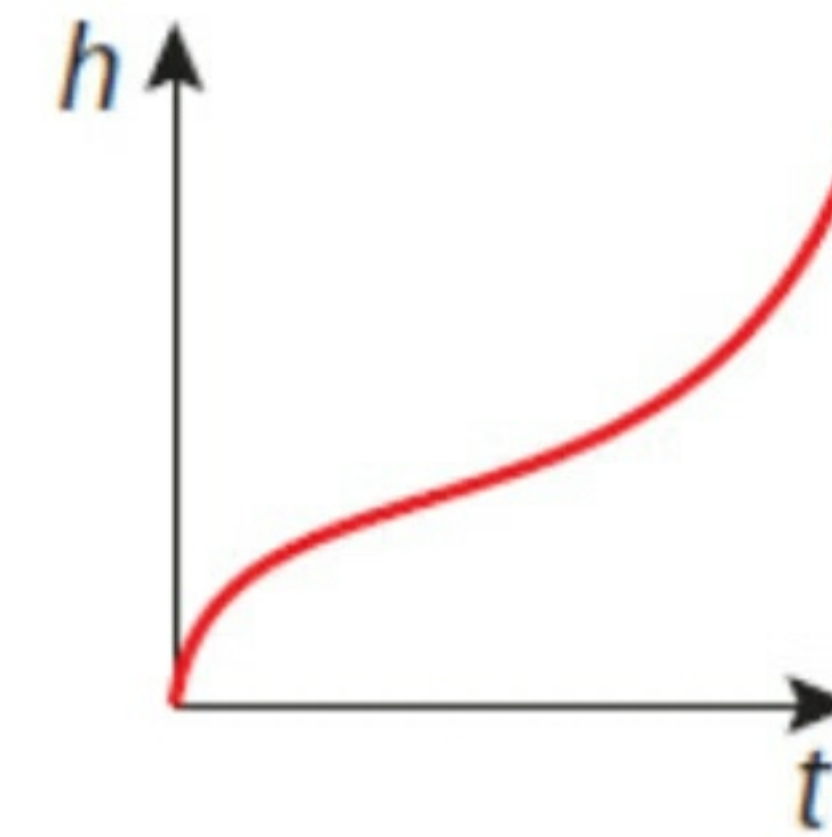
②

D



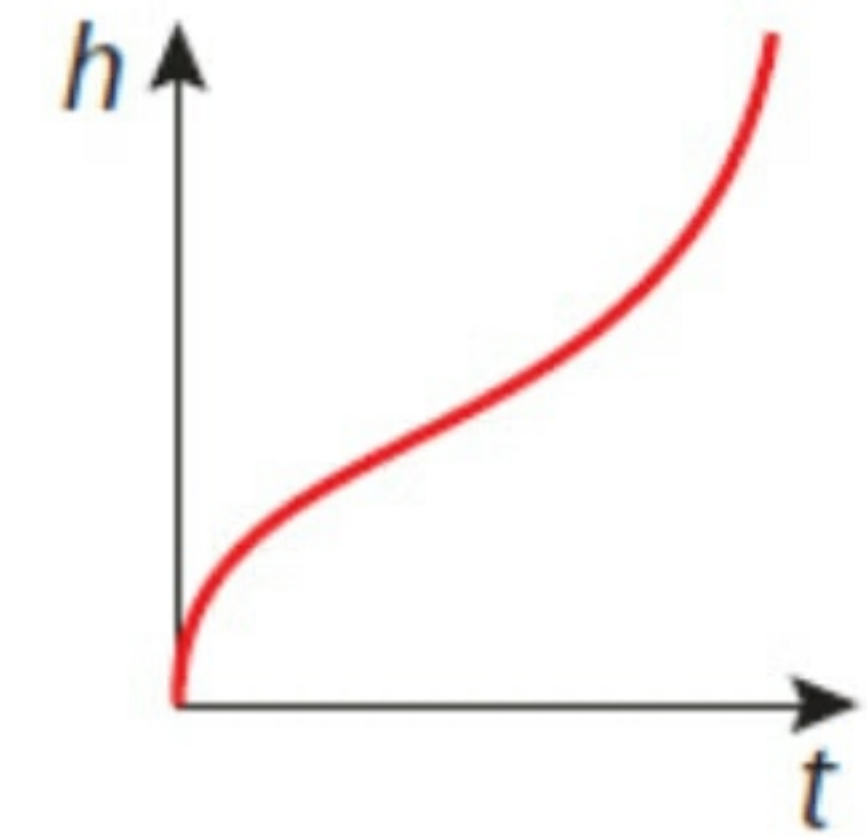
③

C



④

B



⑤

A





# Test Revision

## ① Ratio

Express each of the ratios in its simplest form

① 45 mins : 2 hours

$$45 : 120 \div 5$$

$$9 : 24 \div 3$$

$$3 : 8$$

②  $\frac{4}{3} : \frac{5}{6}$  LCD = 6

$$\frac{6 \times 4}{3} : \frac{6 \times 5}{6}$$

$$\frac{24}{3} : \frac{30}{6}$$

$$8 : 5$$

Q1) A school has a ratio of girls to boys which is 4:3. If there are 292 girls in school, find the total number of pupils in the school.

Q2) A car travels at 210 km on 30 litres of petrol. How much is needed for a journey of 245 km?

Q3) A quantity of food can feed 500 chickens for 14 days.

i) How many chickens can be fed for 20 days on the same quantity?

ii) How long does the quantity last when the number of chickens is 280?

# Answers

## Exercise 20.3

1. 1 and A, (2) and C, (3) and E, (4) and D,  
(5) and B
2. Graph (A)
3. (i) (a) and A, (b) and C, (c) and B  
(ii) 1st graph – B  
2nd graph – C  
3rd graph – A
4. (i) and 3rd graph, (iii) and 2nd, (iv) and 1st
5. A and (4), B and (3), C and (1), D and (5),  
E and (2)
9. (i) It drops      (ii) 5°C      (iii) It rises  
(iv) -12°C      (v) 8 min
10. (i) (3)      (ii) (1)      (iii) (4)
11. A and (2), B and (1), C and (3), D and (4)
12. A and (5), B and (4), C and (3), D and (2),  
E and (1)
13. (i) (a) 60 m      (b) 90 m  
(ii) (a) 2 sec      (b) 8 sec