

Linkages

Bands 1, 2, 3, 4, 5 · 10 questions · Free sample

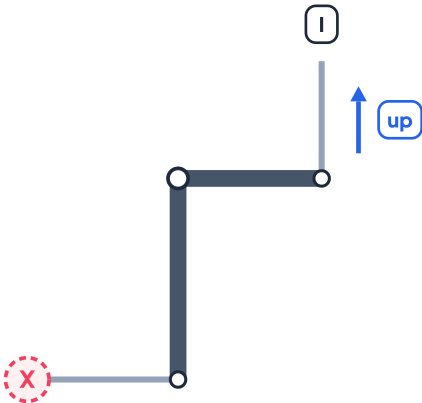
Name _____ Date _____ Score _____ /10

Each picture asks its own question. A lever turns about its pivot: its two ends move opposite ways with the pivot between them and the same way with it at one side, each in proportion to its arm. A crank pin turns a piston to and fro: the stroke is twice the pin's distance from the centre. Circle the letter of your answer.

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1 Band 1

Rod I moves up. Which way does rod X move?



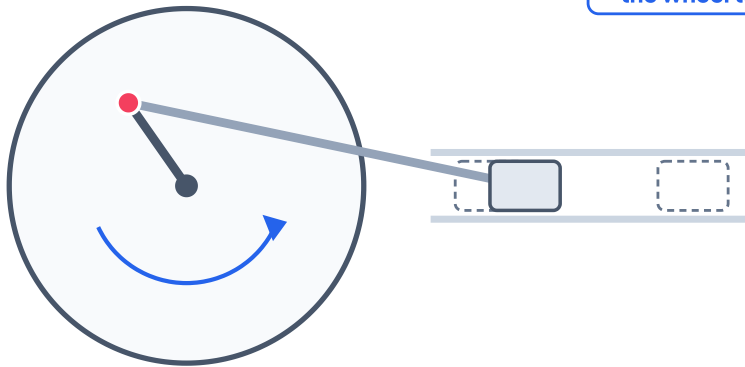
- ☐ A Left
- ☐ B Right
- ☐ C Up
- ☐ D Down

2

Band 1

The wheel turns 5 times. How many strokes does the piston make?

the wheel turns 5 times



(A)

5

(B)

7

(C)

8

(D)

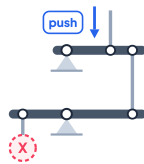
10

3

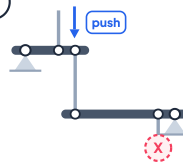
Band 2

The handle is pushed down in each. In which does X move down?

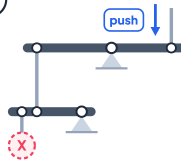
(A)



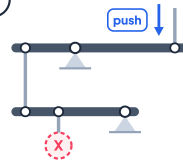
(B)



(C)



(D)



(A)

A

(B)

B

(C)

C

(D)

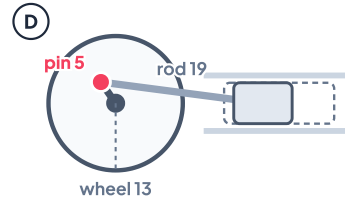
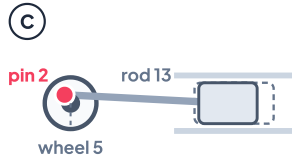
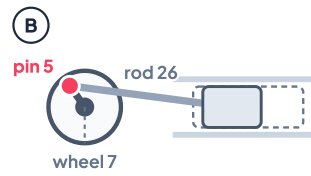
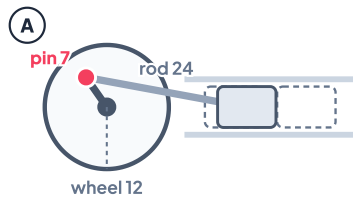
D

4

Band 2

Which piston has the longest stroke?

radii, pin distances and rods in cm; rods not to scale



(A)

A

(B)

B

(C)

C

(D)

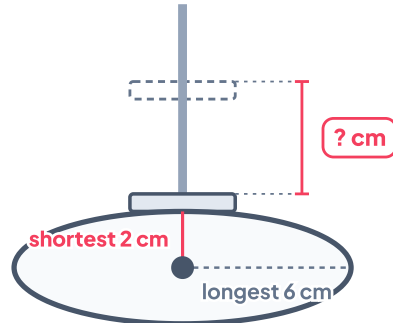
D

5

Band 3

How far does the follower rise as the cam turns, from its lowest to its highest?

not to scale



(A)

4 cm

(B)

6 cm

(C)

8 cm

(D)

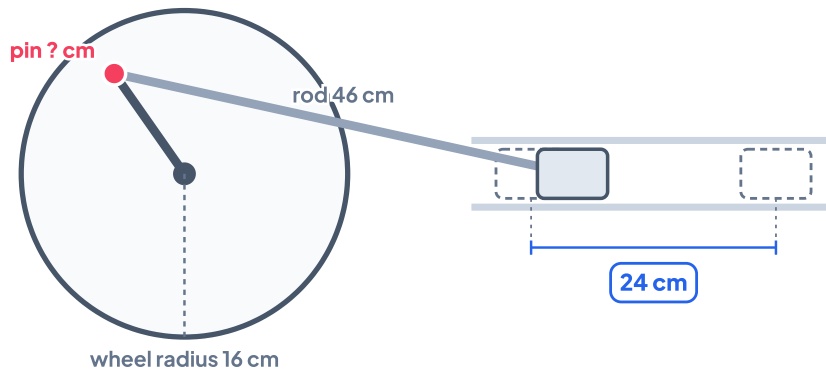
12 cm

6

Band 3

The piston's stroke is 24 cm. How far is the pin from the centre of the wheel?

not to scale



(A)

6 cm

(B)

12 cm

(C)

24 cm

(D)

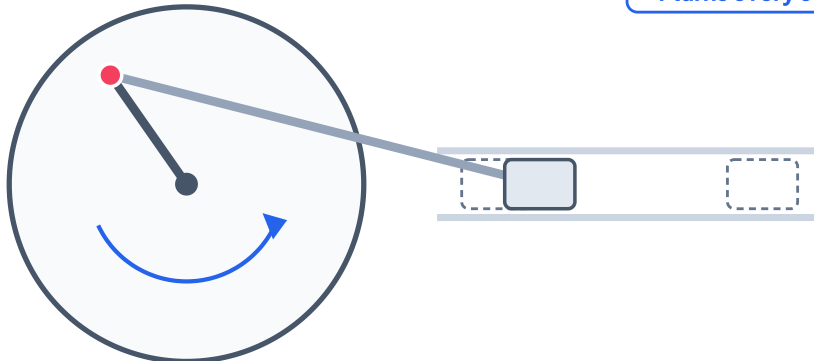
48 cm

7

Band 4

The wheel turns 4 times a second. How many strokes does the piston make in 2 seconds?

4 turns every second



(A)

6

(B)

8

(C)

16

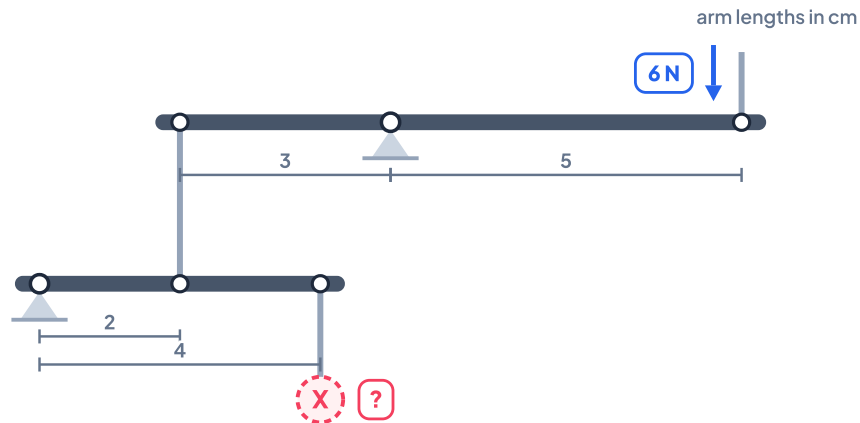
(D)

32

8

Band 4

The handle is pushed with 6 N. With what force does X push?



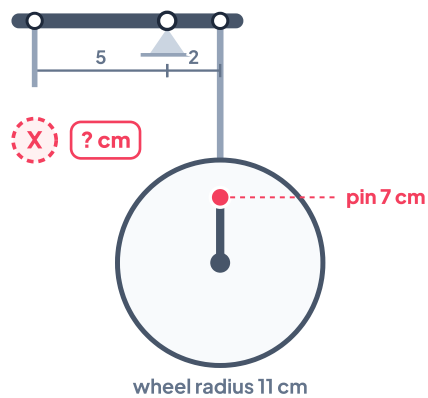
- (A) 5 N (B) 6 N (C) 10 N (D) 20 N

9

Band 5

How far does the end X of the lever move, from its lowest to its highest?

not to scale; the pin is drawn at its highest

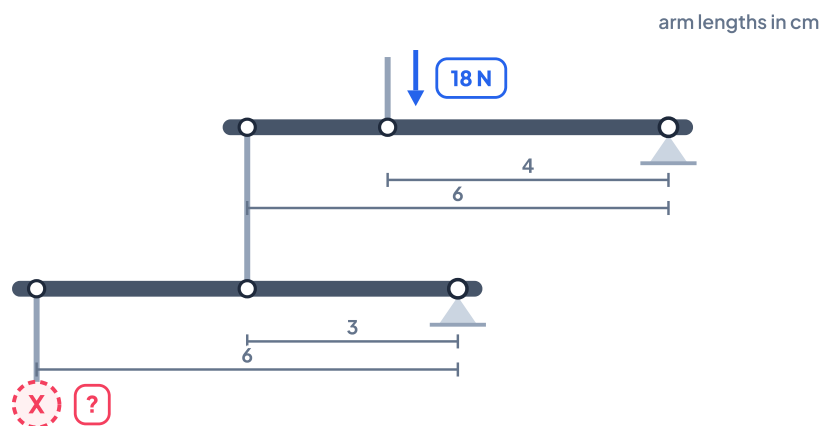


- (A) 14 cm (B) 35 cm (C) 70 cm (D) 105 cm

10

Band 5

The handle is pushed with 18 N. With what force does X push?



(A)

2 N

(B)

3 N

(C)

6 N

(D)

18 N

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