

Construction and Industry

*Mechanical-Aptitude
Mechanical Aptitude Exam*



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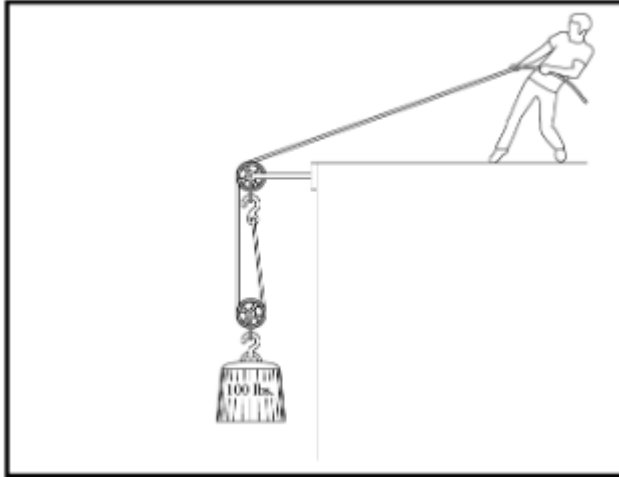
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Question: 1

In the figure above, about how much force does the man have to pull with to raise the 100 lb weight?



- A. 200 pounds
- B. 100 pounds
- C. 50 pounds
- D. 25 pounds

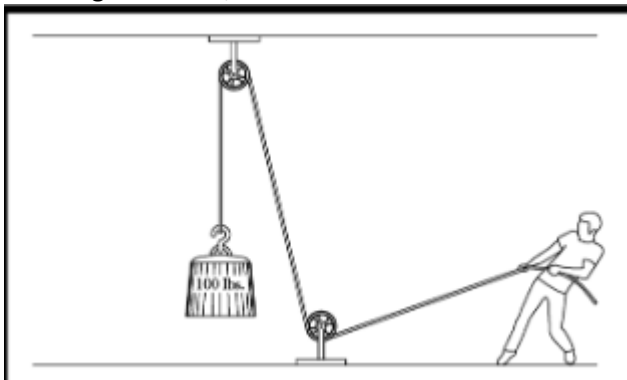
Answer: C

Explanation:

There are two rope segments supporting the weight in this figure, so the 100 pounds is divided by 2.

Question: 2

In the figure above, about how much force does the man have to pull with to raise the 100 lb weight?



- A. 200 pounds
- B. 100 pounds
- C. 50 pounds
- D. 25 pounds

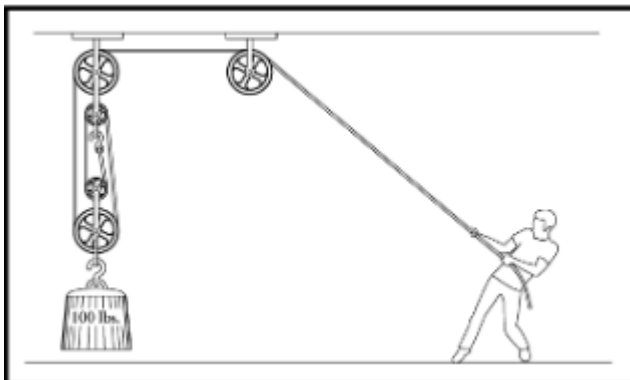
Answer: B

Explanation:

This is only one rope segments supporting the weight in this figure, so the man has to pull with the entire 100 pounds.

Question: 3

In the figure above, about how much force does the man have to pull with to raise the 100 lb weight?



- A. 100 pounds
- B. 50 pounds
- C. 33 pounds
- D. 25 pounds

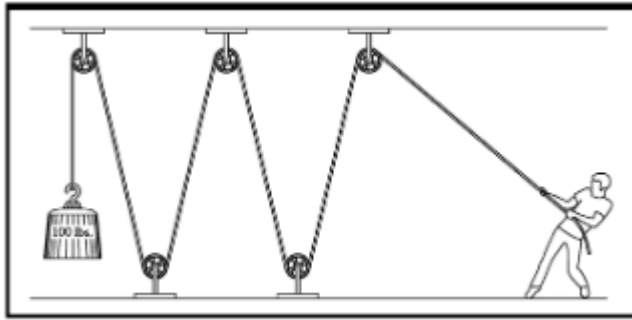
Answer: D

Explanation:

There are four rope segments supporting the weight in this figure, so the 100 pounds is divided by 4.

Question: 4

In the figure above, about how much force does the man have to pull with to raise the 100 lb weight?



- A. 100 pounds
- B. 50 pounds
- C. 20 pounds
- D. 17 pounds

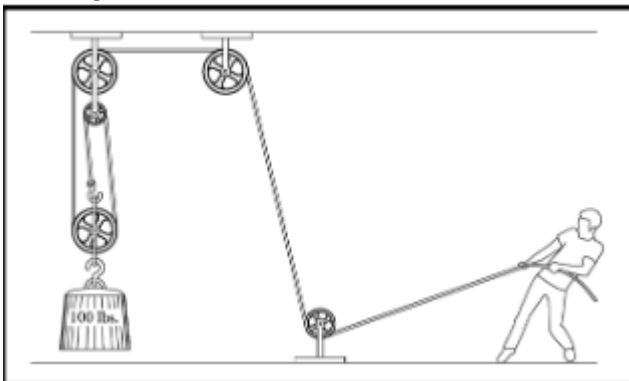
Answer: A

Explanation:

Even though the rope passes through five pulleys, it is still just the one segment supporting the 100 pounds.

Question: 5

In the figure above, about how much force does the man have to pull with to raise the 100 lb weight?



- A. 100 pounds
- B. 50 pounds
- C. 33 pounds
- D. 25 pounds

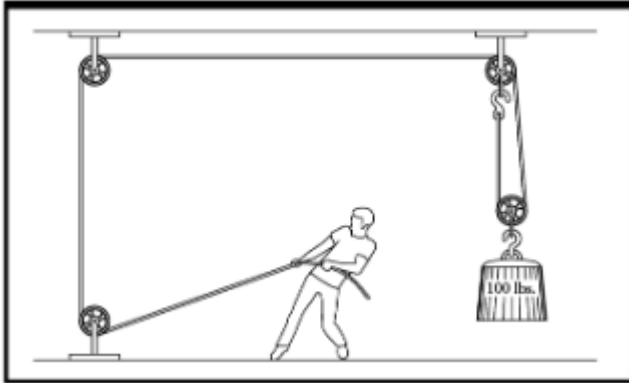
Answer: C

Explanation:

There are three rope segments supporting the weight in this figure, so the 100 pounds is divided by 3.

Question: 6

In the figure above, about how much force does the man have to pull with to raise the 100 lb weight?



- A. 200 pounds
- B. 100 pounds
- C. 50 pounds
- D. 25 pounds

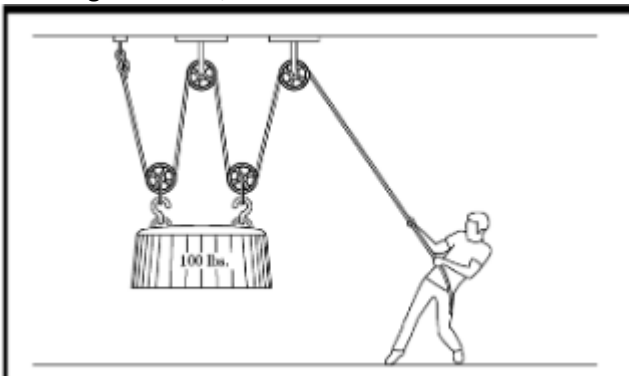
Answer: C

Explanation:

There are two rope segments supporting the weight in this figure, so the 100 pounds is divided by 2.

Question: 7

In the figure above, about how much force does the man have to pull with to raise the 100 lb weight?



- A. 100 pounds
- B. 50 pounds
- C. 33 pounds
- D. 25 pounds

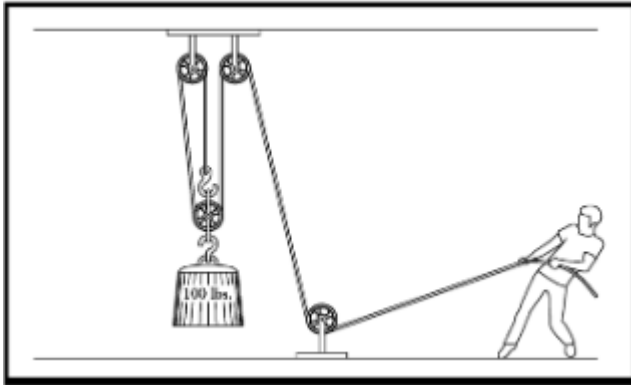
Answer: D

Explanation:

There are four rope segments supporting the weight in this figure, so the 100 pounds is divided by 4.

Question: 8

In the figure above, about how much force does the man have to pull with to raise the 100 lb weight?



- A. 100 pounds
- B. 50 pounds
- C. 33 pounds
- D. 25 pounds

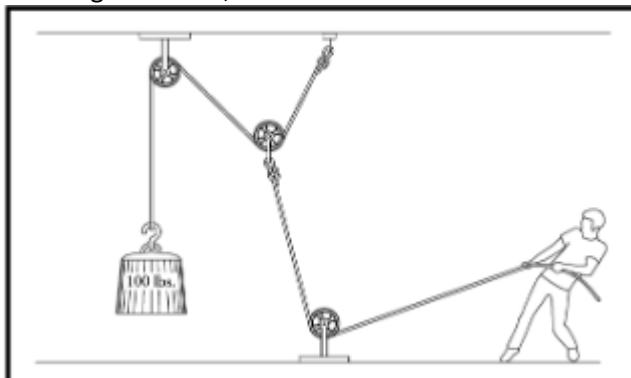
Answer: C

Explanation:

There are three rope segments supporting the weight in this figure, so the 100 pounds is divided by 3.

Question: 9

In the figure above, about how much force does the man have to pull with to raise the 100 lb weight?



- A. 200 pounds

- B. 100 pounds
- C. 50 pounds
- D. 25 pounds

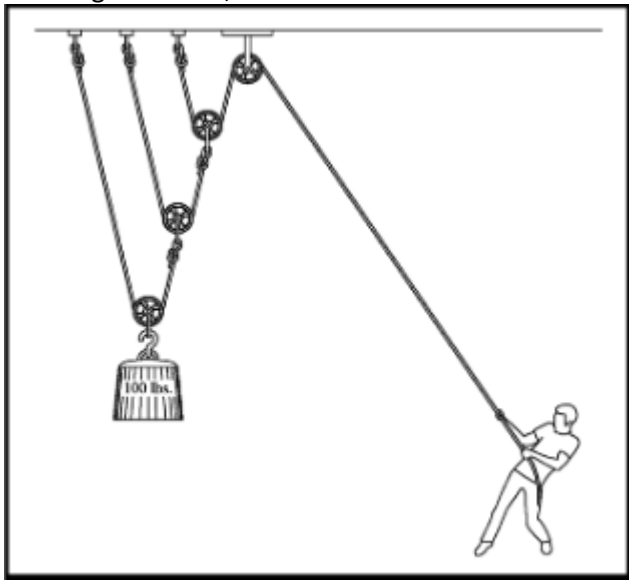
Answer: A

Explanation:

This pulley system is actually making it more difficult for the man to raise the weight. Instead of the weight being supported by 2 rope segments, the rope the man is pulling on is attached to a pulley that is resisted by two rope segments, each of which carries 100 pounds of tension from the 100-pound weight. Therefore, the man has to pull with 200 pounds of force to lift the 100-pound weight here. As a consolation though, for every foot he pulls, the weight is raised half a foot.

Question: 10

In the figure above, about how much force does the man have to pull with to raise the 100 lb weight?



- A. 100 pounds
- B. 33 pounds
- C. 25 pounds
- D. 13 pounds

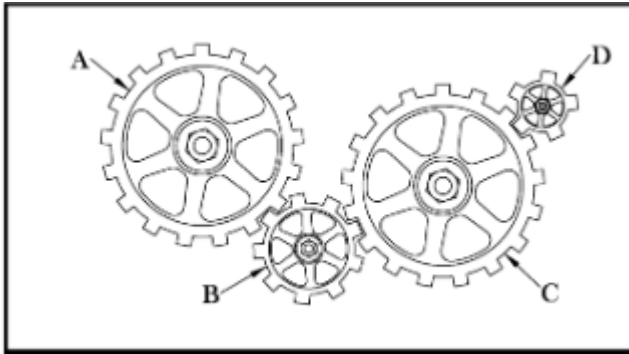
Answer: C

Explanation:

In this system, the 100 pounds of the weight is supported by two rope segments, each of which holds 50 pounds of tension. One of these segments is supported by two more rope segments, each of which holds half of the 50 pounds, or 25 pounds of tension. Finally, one of these segments is supported by yet another pair of rope segments, each of which holds half of the 25 pounds, or 12.5 pounds of tension. This rope is the one the man is pulling on.

Question: 11

In the figure above, if gear D is turning clockwise, which direction is gear A turning?



- A. Clockwise
- B. Counterclockwise

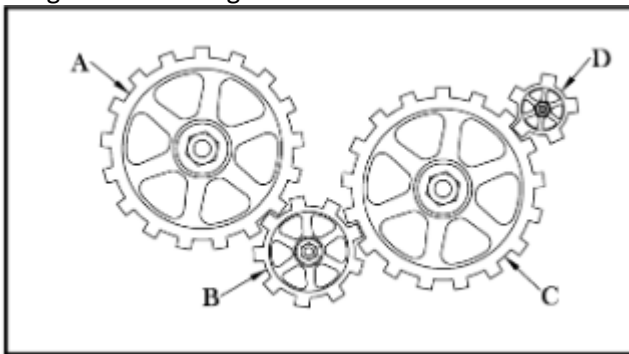
Answer: B

Explanation:

Adjacent gears turn in opposite directions. The direction alternates 3 times between D and A.

Question: 12

In the figure above, if gear C is turning at 100 RPM, which of the following is the best estimate for how fast gear B is turning?



- A. 30 RPM
- B. 50 RPM
- C. 100 RPM
- D. 200 RPM

Answer: D

Explanation:

Gear B is only about half as big as gear C, so it must be turning about twice as fast.

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