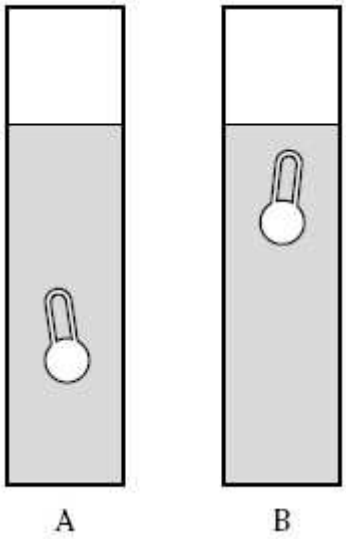
Question 41



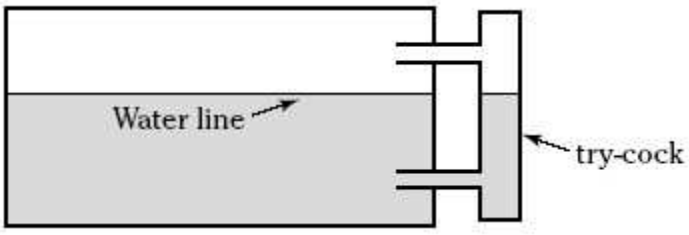
The floats in Tubes A and B measure specific gravity. Which tube contains the liquid with the higher specific gravity?

A. Tube A
B. Tube B
C. It can't be determined.
D. Both Tube A and Tube B have the same specific gravity.
Answer: B
Explanation:
Specific gravity is a comparison between the weight of a liquid and the weight of water. The liquid with the higher specific gravity will have a float that rises higher.

Question 42
Universal joints are used to:

A. connect ball bearings
B. fix two shafts so they don't pivot or rotate
C. connect shafts in a U-shape
D. couple two shafts set at different angles
Answer: D
Explanation:
Universal joints are used to connectshafts that aren't in the same plane.

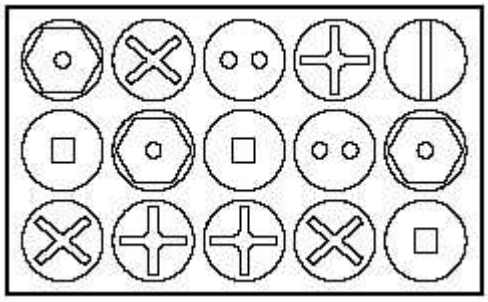
Question 43



The try-cock in the schematic above measures:

A. temperature of water
B. pressure of water
C. pressure of steam buildup
D. level of water
Answer: D
Explanation:
Try-cocks measure water level. Water seeks a level throughout a system, so in the schematic, the try- cock correctly indicates the water level.

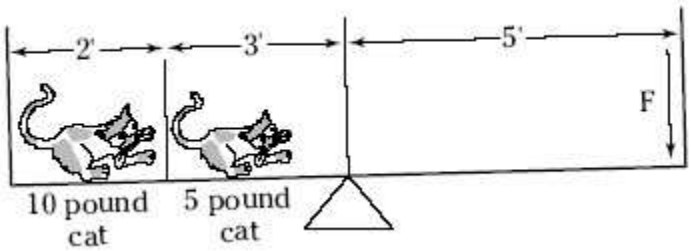
Question 44



The steel plate above is held in place by different machine screws, each indicated by different symbols. How many different types of machine screws have been used?

A. 6
B. 15
C. 5
D. 9
Answer: A
Explanation:
There are 6 different symbols, so 6 different types of machine screws were used.

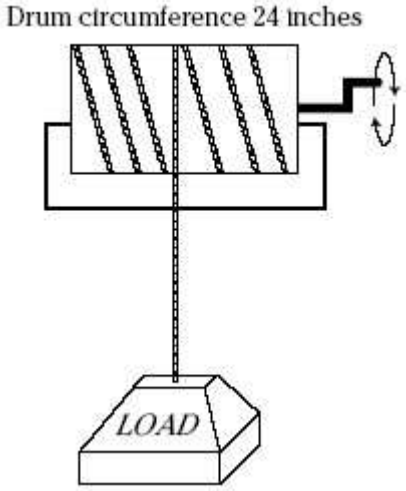
Question 45



The amount of force (F) needed to balance the lever in the figure above is most nearly:

A. 15 pounds
B. 13 pounds
C. 7.5 pounds
D. 20 pounds
Answer: B
Explanation:
To determine the amount of force exerted by the cats, first multiply the length of the resistance arm (as it applies to the cat) by the weight of each cat and add the products together. The 10-pound cat is Add `em up: 50 + 15 = 65. This number is equal to the length of the resistance arm times effort (force)

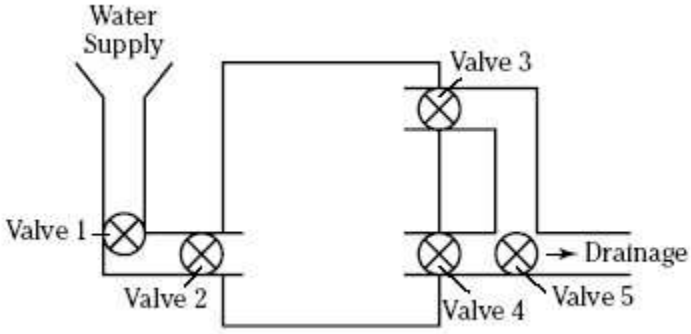
Question 46



With one complete revolution of the cable winch shown above, the load will move:

A. 12 inches
B. 6 inches
C. 24 inches
D. 36 inches
Answer: C
Explanation:
One revolution of the winch will move the weight 24 inches, the circumference of the winch drum.

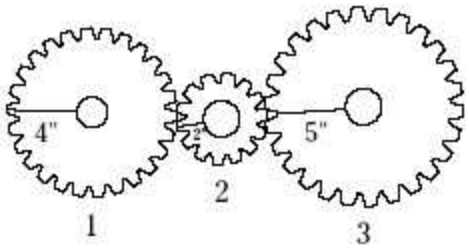
Question 47



In the figure above, assume the valves are all closed. Which valves need to be open to fill the tank entirely?

A. 1 and 2 only
B. 1 only
C. 1, 2, and 3
D. 2 only
Answer: A
Explanation:
Valves 1 and 2 need to be open to fill the tank

Question 48



If Gear 1 in the figure above makes 10 complete clockwise revolutions per minute, then:

A. Gear 2 makes 2 clockwise revolutions per minute.
B. Gear 3 makes 8 clockwise revolutions per minute.
C. Gear 3 makes 30 clockwise revolutions per minute.
D. Gear 3 makes 9 counterclockwise revolutions per minute.
Answer: B
Explanation:
Gear 1 makes 10 clockwise revolutions per minute. Gear 2, which is half the size, makes 20 counterclockwise revolutions per minute. (The number of revolutions it makes is inversely proportional to its difference in size.) Gear 2 is half the size of Gear 1, so to determine the number of revolutions it Gear 3 is 2.5 times the size of Gear 2. In other words, it is 5/2 the size of Gear 2. To determine the number of revolutions Gear 3 makes, multiply the inverse of 5/2 by the number of revolutions Gear 2 (the fraction of revolutions Gear 3 makes) = 40/5 or 8 revolutions per minute.

Question 49
A gear and pinion have a ratio of 4 to 1. If the gear makes 200 revolutions per minute, the speed of the pinion is:

A. 50 rpm
B. 800 rpm
C. 400 rpm
D. 200 rpm
Answer: B

Question 50
The gas gauge in an auto relies on what mechanical device to measure the amount of gas in the tank?

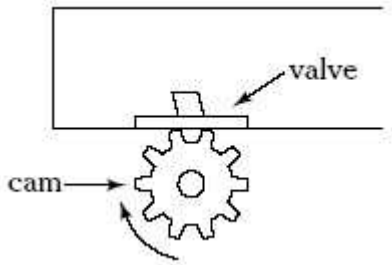
A. ball and cock
B. automatic valve
C. float
D. mechanical switch
Answer: C
Explanation:
A float indicates the level of liquid in a container.

Question 51
Using a runner gives you a mechanical advantage of:

A. 4
B. 2
C. 3
D. 1
Answer: B

Explanation:
Using a runner (a single, moveable pulley) gives a mechanical advantage of 2.

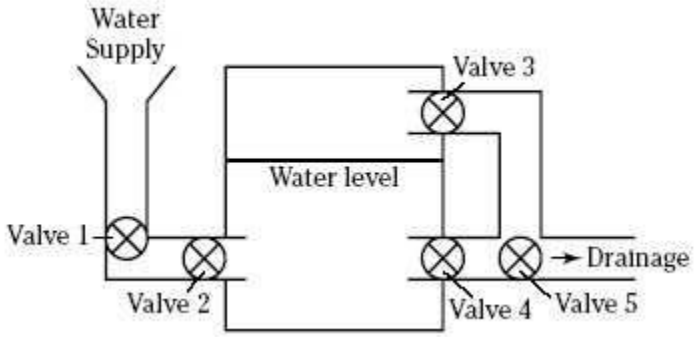
Question 52



For the valve shown in the figure above to open once each second, the cam must revolve at a rate of:

A. 6 rpm
B. 10 rpm
C. 15 rpm
D. 3 rpm
Answer: A
Explanation:
Because 60 seconds comprise a minute, the valve must open 60 times per minute. The cam will open the valve 60 times per minute.

Question 53



The figure above represents a water tank. Which of the following statements is not true?

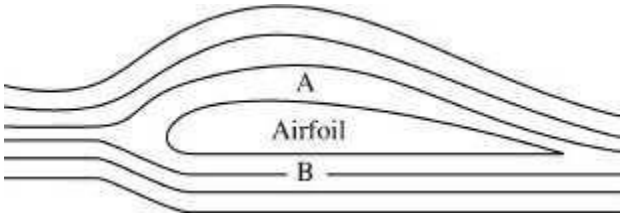
A. If Valves 1 and 2 are open and Valves 3,4, and 5 are closed, the tank will eventually overflow.
B. If all valves are open, the water remains at a constant level as long as the rate of intake is equal to the rate of discharge.
C. Water in the tank will rise if Valves 1 and 2 are open and Valves 3 and 4 are closed.
D. The tank will empty entirely if Valves 1 and 2 are closed and Valves 4 and 5 are open.
Answer: D
Explanation:
Because Valve 4 is above the bottom of the tank, some water will remain in the tank below the level of the valve, so the tank will never be completely empty.

Question 54
Heat is a form of

A. calories.

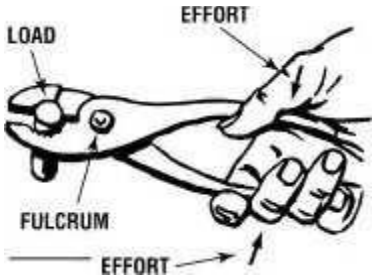
B. energy.
C. beneficence.
D. motion.
Answer: B
Explanation:
Heat is a form of energy-Caloriesmeasure heat,beneficenceis an attitude or emotion, andmotionis something that can cause heat.

Question 55
The lift caused by an aircraft's wings is primarily due to



A. a decrease in pressure on the upper side of the wing (A).
B. a decrease in pressure on the bottom side of the wingB.
C. a vacuum created under the wing at point B.
D. an increase in pressure on the upper side of the wing (A).
Answer: A
Explanation:
When oncoming air meets the leading edge of the airfoil (wing), some of it goes over the top of the airfoil and some of it flows underneath. The air flowing over the top of the wing has to go further than the air underneath, because it must join together again with the air that flowed under the wing at the far (back) side of the wing--physical laws act together to prevent or minimize vacuums in most cases.

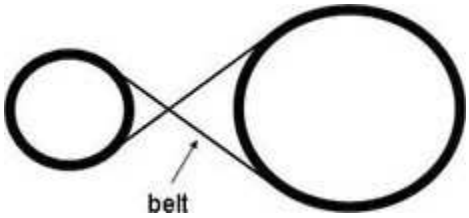
Question 56
Pliers are an example of a



A. first-class lever.
B. second-class lever.
C. third-class lever.
D. fourth-class lever.
Answer: A
Explanation:
Pliers are an example of a first-class lever because the fulcrum is positioned between the effort (where your hand grips the pliers) and the load (the object that is being held or squeezed by the pliers).

Question 57
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.
Answer: D
Explanation:
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 fester and complete more turns than the larger wheel

Question 58
How can a gear system derive the greatest amount of mechanical advantage when a seven-tooth gear drives a

A. 29-tooth gear.
B. 5-toothgear.
C. 24-tooth gear.
D. 17-tooth gear.
Answer: A
Explanation:
The greater the difference between the number of teeth of the two meshed gears, the greater the torque or mechanical advantage