

Math questions from FAA Test Bank

1: What power of 10 is equal to 1,000,000?

A: 10 to the fourth power.

B: 10 to the fifth power.

C: 10 to the sixth power.

2: What is the speed of a spur gear with 42 teeth driven by a pinion gear with 14 teeth turning 420 RPM?

A: 588 RPM.

B: 160 RPM.

C: 140 RPM.

3: A rectangular-shaped fuel tank measures 60 inches in length, 30 inches in width, and 12 inches in depth. How many cubic feet are within the tank?

A: 12.5.

B: 15.0.

C: 21.0.

4: (Refer to Figure 56.) Compute the area of the trapezoid.

A: 24 square feet.

B: 48 square feet.

C: 10 square feet.

5: Solve the equation.  $[(4x - 3) + (-9x + 2)] \div 2 =$

A: -30

B: -15

C: -5

6: Solve the equation.  $(64 \times \frac{3}{8}) \div \frac{3}{4} =$

A: 18

B: 24

C: 32

7: The number  $3.47 \times 10$  to the negative fourth power is equal to

A: .00347.

B: 34,700.0.

C: .000347.

8: Solve the equation.  $(-3 + 2)(-12 - 4) + (-4 + 6) \times 3$

A: 20

B: 22

C: 28

9: (Refer to Figure 59.) Solve the equation.

A: +31.25.

- B: -5.20.  
C: -31.25.

10: Find the square root of 3,722.1835.

- A: 61.00971.  
B: 61.00.  
C: 61.0097.

11: An airplane flying a distance of 750 miles used 60 gallons of gasoline. How many gallons will it need to travel 2,500 miles?

- A: 250  
B: 240  
C: 200

12: Solve the equation.  $-6[-9(-8 + 4) - 2(7 + 3)] =$

- A: -332  
B: 216  
C: -96

13: How many gallons of fuel will be contained in a rectangular-shaped tank which measures 2 feet in width, 3 feet in length, and 1 foot 8 inches in depth? (7.5 gal = 1 cu ft)

- A: 66.6.  
B: 75  
C: 45

14: Find the square root of 124.9924.

- A:  $111.8 \times 10$  to the third power.  
B:  $.1118 \times 10$  to the negative second power.  
C:  $1,118 \times 10$  to the negative second power.

15: What force is exerted on the piston in a hydraulic cylinder if the area of the piston is 1.2 square inches and the fluid pressure is 850 PSI?

- A: 1,020 pounds.  
B: 960 pounds.  
C: 850 pounds.

16: A certain aircraft bolt has an overall length of 1-1/2 inches, with a shank length of 1-3/16 inches, and a threaded portion length of 5/8 inch. What is the grip length?

- A: .5625 inch.  
B: .8750 inch.  
C: .3125 inch.

17: What is the square root of 16 raised to the fourth power?

- A: 1,024.00  
B: 4,096.00  
C: 256

18: A blueprint shows a hole of 0.17187 to be drilled. Which fraction size drill bit is most nearly equal?

A:  $11/64$ .

B:  $9/32$ .

C:  $11/32$ .

19: The result of 7 raised to the third power plus the square root of 39 is equal to

A: 349.24.

B: .34924.

C: 343.24.

20: (Refer to Figure 53.) Solve the equation.

A: .0297.

B: .1680.

C: .0419.

21: A pinion gear with 14 teeth is driving a spur gear with 42 teeth at 140 RPM.

Determine the speed of the pinion gear.

A: 588 RPM.

B: 420 RPM.

C: 125 RPM.

22: What is the speed ratio of a gear with 36 teeth meshed to a gear with 20 teeth?

A: 5 to 12.

B: 6.6 to 12.

C: 5 to 9.

23: Sixty-five engines are what percent of 80 engines?

A: 81 percent.

B: 65 percent.

C: 52 percent.

24: Select the decimal which is most nearly equal to  $77/64$ .

A: 0.08311.

B: 0.8311.

C: 1.2031.

25: Solve the equation.  $2/4 (30 + 34) 5 =$

A: 160.

B: 245.

C: 100.

26: What is the piston displacement of a master cylinder with a 1.5-inch diameter bore and a piston stroke of 4 inches?

A: 9.4247 cubic inches.

- B: 7.0686 cubic inches.
- C: 6.1541 cubic inches.

27: A six-cylinder engine with a bore of 3.5 inches, a cylinder height of 7 inches and a stroke of 4.5 inches will have a total piston displacement of

- A: 256.88 cubic inches.
- B: 259.77 cubic inches.
- C: 43.3 cubic inches.

28: An engine develops 108 horsepower at 87 percent power. What horsepower would be developed at 65 percent power?

- A: 81.
- B: 70.
- C: 61.

29: The parts department's profit is 12 percent on a new part. How much does the part cost if the selling price is \$145.60?

- A: \$128.13.
- B: \$125.60.
- C: \$130.00

30: If the volume of a cylinder with the piston at bottom center is 84 cubic inches and the piston displacement is 70 cubic inches, then the compression ratio is

- A: 7:1.
- B: 1.2:1.
- C: 6:1.

31: (Refer to Figure 52.) Solve the equation.

- A: 115
- B: 4.472.
- C: 5

32: Find the cube of 64.

- A: 4
- B: 192
- C: 262,144.00

33: (Refer to Figure 60.) Solve the equation.

- A: 11.9.
- B: 11.7.
- C: 11.09.

34: Find the square root of 1,824.

- A:  $42.708 \times 10$  to the negative second power.
- B: .42708.
- C:  $.42708 \times 10$  to the second power.

35: A four-cylinder aircraft engine has a cylinder bore of 3.78 inches and is 8.5 inches deep. With the piston on bottom center, the top of the piston measures 4.0 inches from the bottom of the cylinder. What is the approximate piston displacement of this engine?

A: 200 cubic inches.

B: 360 cubic inches.

C: 235 cubic inches.

36: Solve the equation.  $4 - 3[-6(2 + 3) + 4] =$

A: 82

B: -25

C: -71

37: What is the ratio of a gasoline fuel load of 200 gallons to one of 1,680 pounds?

A: 5:07

B: 2:03

C: 5:42

38: What is the ratio of 10 feet to 30 inches?

A: 4:01

B: 1:03

C: 3:01

39: Express  $\frac{5}{8}$  as a percent.

A: .625 percent.

B: 6.25 percent.

C: 62.5 percent.

40: If an engine is turning 1,965 rpm at 65 percent power, what is its maximum rpm?

A: 2,653.00

B: 3,023.00

C: 3,242.00

41: Select the fraction which is equal to .025.

A:  $\frac{1}{4}$ .

B:  $\frac{1}{40}$ .

C:  $\frac{1}{400}$ .

42: Which decimal is most nearly equal to a bend radius of  $\frac{31}{64}$ ?

A: 0.2065.

B: 0.4844.

C: 0.3164.

43: A rectangular-shaped fuel tank measures  $37\frac{1}{2}$  inches in length, 14 inches in width, and  $8\frac{1}{4}$  inches in depth. How many cubic inches are within the tank?

A: 525

B: 433.125.  
C: 4,331.25.

44: How much current does a 30-volt motor, 1/2 horsepower, 85 percent efficient, draw from the bus?|(Note: 1 horsepower = 746 watts)

A: 14.6 amperes.  
B: 12.4 amperes.  
C: 14.3 amperes.

45: (Refer to Figure 58.) Solve the equation.

A: 174.85.  
B: 68.037.  
C: 14.002.

46: (Refer to Figure 55.) Find the area of the triangle shown.

A: 12 square inches.  
B: 6 square inches.  
C: 15 square inches.

47: What is the square root of 4 raised to the fifth power?

A: 32  
B: 64  
C: 20

48: An engine of 98 horsepower maximum is running at 75 percent power. What is the horsepower being developed?

A: 87.00.  
B: 33.30.  
C: 73.50.

49: The total piston displacement of a specific engine is

A: dependent on the compression ratio.  
B: the volume displaced by all the pistons during one revolution of the crankshaft.  
C: the total volume of all the cylinders.

50: 1.21875 is equal to

A: 83/64.  
B: 19/16.  
C: 39/32.

51: Which alternative answer is equal to 16,300?

A:  $1.63 \times 10$  to the fourth power.  
B:  $1.63 \times 10$  to the negative third power.  
C:  $163 \times 10$  to the negative second power.

52: What size sheet of metal is required to fabricate a cylinder 20 inches long and 8 inches in diameter? (Note:  $C = \pi \times D$ )

A: 20" x 25-5/32".

B: 20" x 24-9/64".

C: 20" x 25-9/64".

53: (Refer to Figure 54.) Compute the area of the trapezoid.

A: 52.5 square feet.

B: 60 square feet.

C: 76.5 square feet.

54: The radius of a piece of round stock is  $\frac{7}{32}$ . Select the decimal which is most nearly equal to the diameter.

A: 0.2187.

B: 0.4375.

C: 0.3531.

55: Which of the following is the square root of  $(-1776)/(-2) - 632$ ?

A: 4.

B: 8.

C: 16.

56: A rectangular shaped fuel tank measures 27-1/2 inches in length, 3/4 foot in width, and 8-1/4 inches in depth. How many gallons will the tank contain? (231 cu in = 1 gal)

A: 7.86.

B: 8.80.

C: 9.80.

57: (Refer to Figure 57.) Determine the area of the triangle formed by points A, B, and C.

A to B = 7.5 inches | A to D = 16.8 inches

A: 42 square inches.

B: 63 square inches.

C: 126 square inches.

58: Find the square root of 1,746.

A: 41.7852.

B: 41.7752.

C: 40.7742.

59: Express  $\frac{7}{8}$  as a percent.

A: 8.75 percent.

B: .875 percent.

C: 87.5 percent.

60: Select the fractional equivalent for a 0.0625 inch thick sheet of aluminum.

A:  $\frac{1}{16}$ .

B:  $\frac{3}{64}$ .

C:  $\frac{1}{32}$ .

61: Find the value of 10 raised to the negative sixth power.

A: 0.000001.

B: 0.000010.

C: 0.0001.

62: Solve the equation.  $(32 \times \frac{3}{8}) \div \frac{1}{6} =$

A: 12

B: 2

C: 72

63: Maximum engine life is 1100 hours. Recently, 27 engines were removed with an average life of 835.3 hours. What percent of the maximum engine life has been achieved?

A: 75.9 percent.

B: 76.9 percent.

C: 75.0 percent.

64: Select the container size that will be equal in volume to 60 gallons of fuel. (7.5 gal = 1 cu ft)

A: 7.5 cubic feet.

B: 8.0 cubic feet.

C: 8.5 cubic feet.

Physics questions from FAA Test Bank

1: The force that can be produced by an actuating cylinder whose piston has a cross-sectional area of 3 square inches operating in a 1,000 PSI hydraulic system is most nearly

A: 3,000 pounds.

B: 1,500 pounds.

C: 1,000 pounds.

2: Which atmospheric conditions will cause the true landing speed of an aircraft to be the greatest?

A: Low temperature with low humidity.

B: High temperature with low humidity.

C: High temperature with high humidity.

3: How many, if any, factors are necessary to determine power?<sup>1</sup> 1. Force exerted.<sup>2</sup>

Distance the force moves.<sup>3</sup> 3. Time required to do the work.

A: One.

B: Two.

C: Three.

4: If all, or a significant part of a stall strip is missing on an airplane wing, a likely result will be

A: asymmetrical lateral control at or near stall angles of attack.

B: decreased lift in the area of installation at high angles of attack.

C: asymmetrical lateral control at low angles of attack.

5: Which statement concerning heat and/or temperature is true?

A: There is an inverse relationship between temperature and heat.

B: Temperature is a measure of the kinetic energy of the molecules of any substance.

C: Temperature is a measure of the potential energy of the molecules of any substance.

6: If both the volume and the absolute temperature of a confined gas are doubled, the pressure will

A: not change.

B: be halved.

C: become four times as great.

7: Which will weigh the least?

A: 98 parts of dry air and 2 parts of water vapor.

B: 35 parts of dry air and 65 parts of water vapor.

C: 50 parts of dry air and 50 parts of water vapor.

8: What is absolute humidity?

A: The temperature to which humid air must be cooled at constant pressure to become saturated.

B: The actual amount of the water vapor in a mixture of air and water.

C: The ratio of the water vapor actually present in the atmosphere to the amount that would be present if the air were saturated at the prevailing temperature and pressure.

9: The speed of sound in the atmosphere

A: varies according to the frequency of the sound.

B: changes with a change in temperature.

C: changes with a change in pressure.

10: The temperature to which humid air must be cooled at constant pressure to become saturated is called

A: dewpoint.

B: absolute humidity.

C: relative humidity.

11: The purpose of aircraft wing dihedral is to

A: increase lateral stability.

B: increase longitudinal stability.

C: increase lift coefficient of the wing.

12: If the fluid pressure is 800 PSI in a 1/2-inch line supplying an actuating cylinder with a piston area of 10 square inches, the force exerted on the piston will be

A: 4,000 pounds.

B: 8,000 pounds.

C: 800 pounds.

13: Under which conditions will the rate of flow of a liquid through a metering orifice (or jet) be the greatest (all other factors being equal)?

A: Unmetered pressure -- 18 PSI, metered pressure -- 17.5 PSI, atmospheric pressure -- 14.5 PSI.

B: Unmetered pressure -- 23 PSI, metered pressure -- 12 PSI, atmospheric pressure -- 14.3 PSI.

C: Unmetered pressure -- 17 PSI, metered pressure -- 5 PSI, atmospheric pressure -- 14.7 PSI.

14: Aspect ratio of a wing is defined as the ratio of the

A: wingspan to the wing root.

B: square of the chord to the wingspan.

C: wingspan to the mean chord.

15: If the temperature of a confined liquid is held constant and its pressure is tripled, the volume will

A: triple.

B: be reduced to one-third its original volume.

C: remain the same.

16: Which condition is the actual amount of water vapor in a mixture of air and water?

- A: Relative humidity.
- B: Dewpoint.
- C: Absolute humidity.

17: (Refer to Figure 61.) The amount of force applied to rope A to lift the weight is

- A: 12 pounds.
- B: 15 pounds.
- C: 20 pounds.

18: A wing with a very high aspect ratio (in comparison with a low aspect ratio wing) will have

- A: increased drag at high angles of attack.
- B: a low stall speed.
- C: poor control qualities at low airspeeds.

19: Which of the following is NOT considered a method of heat transfer?

- A: Convection.
- B: Conduction.
- C: Diffusion.

20: If the volume of a confined gas is doubled (without the addition of more gas), the pressure will (assume the temperature remains constant)

- A: increase in direct proportion to the volume increase.
- B: remain the same.
- C: be reduced to one-half its original value.

21: How much work input is required to lower (not drop) a 120-pound weight from the top of a 3-foot table to the floor?

- A: 120 pounds of force.
- B: 360 foot-pounds.
- C: 40 foot-pounds.

22: The desired effect of using winglets on an aircraft's wingtips is to

- A: increase the lift to drag ratio.
- B: reduce the aspect ratio.
- C: optimize wing dihedral and improve lateral stability

23: Which is the ratio of the water vapor actually present in the atmosphere to the amount that would be present if the air were saturated at the prevailing temperature and pressure?

- A: Absolute humidity.
- B: Relative humidity.
- C: Dewpoint.

24: What force must be applied to roll a 120-pound barrel up an inclined plane 9 feet long to a height of 3 feet (disregard friction)? $L \div I = R \div E$  |  $L =$  Length of ramp, measured

along the slope. |I = Height of ramp. |R = Weight of object to be raised or lowered. |E = Force required to raise or lower object.

A: 40 pounds.

B: 120 pounds.

C: 360 pounds.

25: An engine that weighs 350 pounds is removed from an aircraft by means of a mobile hoist. The engine is raised 3 feet above its attachment mount, and the entire assembly is then moved forward 12 feet. A constant force of 70 pounds is required to move the loaded hoist. What is the total work input required to move the hoist?

A: 840 foot-pounds.

B: 1,890 foot-pounds.

C: 1,050 foot-pounds.

26: The boiling point of a given liquid varies

A: directly with pressure.

B: inversely with pressure.

C: directly with volume.

27: An airplane wing is designed to produce lift resulting from

A: positive air pressure below and above the wing's surface along with the downward deflection of air.

B: positive air pressure below the wing's surface and negative air pressure above the wing's surface along with the downward deflection of air.

C: negative air pressure below the wing's surface and positive air pressure above the wing's surface along with the downward deflection of air.