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QUESTION 1

What is the average of: 15, 25%, 1/2 and sin0?

A. 3.02

B. 3.94

C. 4.20

D. 4.64

E. 5.21

Correct Answer: B

The important part is to do these as quick as possible to leave room for the lengthier QR problems. Simply convert the numbers to 15, 0.25, 0.5 and 0. Add them up and divide by 4 to find the average.

QUESTION 2

A square has an area of 36. If you doubled the length of the sides of the square, what will its new perimeter be?

A. 24

B. 36

C. 48

D. 52

E. 72

Correct Answer: C

If a square has an area of 36, it\\'s sides must be 6, as s2 = area of a square.

Doubling the side of the square gives 12. Add all 4 sides (12 + 12 + 12 + 12) and you have a perimeter of

48.

QUESTION 3

It is most likely that you have never had diphtheria. You probably don\\'t even know anyone who has suffered from this disease. In fact, you may not even know what diphtheria is. Similarly, diseases like whooping cough, measles, mumps, and rubella may all be unfamiliar to you. In the nineteenth and early twentieth centuries, these illnesses struck hundreds of thousands of people in the United States each year, mostly children, and tens of thousands of people died. The names of these diseases were frightening household words. Today, they are all but forgotten. That change happened largely because of vaccines.

You probably have been vaccinated against diphtheria. You may even have been exposed to the bacterium that causes

it, but the vaccine prepared your body to fight off the disease so quickly that you were unaware of the infection. Vaccines take advantage of your body\\'s natural ability to learn how to combat many disease-causing germs, or microbes. What\\'s more, your body remembers how to protect itself from the microbes it has encountered before. Collectively, the parts of your body that remember and repel microbes are called the immune system. Without the proper functioning of the immune system, the simplest illness ?even the common cold ?could quickly turn deadly.

On average, your immune system needs more than a week to learn how to fight off an unfamiliar microbe. Sometimes, that isn\\'t enough time. Strong microbes can spread through your body faster than the immune system can fend them off. Your body often gains the upper hand after a few weeks, but in the meantime you are sick. Certain microbes are so virulent that they can overwhelm or escape your natural defenses. In those situations, vaccines can make all the difference.

Traditional vaccines contain either parts of microbes or whole microbes that have been altered so that they don\\'t cause disease. When your immune system confronts these harmless versions of the germs, it quickly clears them from your body. In other words, vaccines trick your immune system in order to teach your body important lessons about how to defeat its opponents.

What is the main idea of the passage?

A. The nineteenth and early twentieth centuries were a dark period for medicine.

B. You have probably never had diphtheria.

C. Traditional vaccines contain altered microbes.

D. Vaccines help the immune system function properly.

Correct Answer: D

The main idea of this passage is that vaccines help the immune system function properly. Answer choices [The nineteenth and early twentieth...], [You have probably never had diphtheria.] and [Traditional vaccines contain altered microbes.] express details from the passage, but only answer choice [Vaccines help the immune system function properly.] is a comprehensive summary of the author\\'s message.

QUESTION 4

Sutures are:

A. Bone to bone connectors, such as the knee joint

B. Points of attachment for skeletal muscle to bone

C. Immovable joints, such as in the human skull

D. The replacement of cartilage by bone

E. None of the above

Correct Answer: C

This is the definition of sutures. Tendons are what attaches muscle to bone. Endochondral ossification is replacing existing cartilage with bone

QUESTION 5

A circle is stretched out and its circumference is increased by 10%. What is the percent increase of the area of that circle?

A. 10%

B. 16%

C. 21%

D. 25%

E. 30%

Correct Answer: C

The circumference of a circle can be expressed with the following formula: C = 2?r

Notice how this means the radius is proportional to the circumference. This means that a percentage increase in the circumference will have the same percentage increase in the radius. Thus, if the circumference increases by 10%, so does the radius. Insert a random value for the radius. For this example, 10 will be used. If we were to increase the circumference by 10%, the radius (10) must also be increased by 10%. 10% of 10 is 1, thus an additional 10% of 10 will be 11.

The area of a circle can be expressed with the following formula: A = ?(r2). If we insert our original radius value of 10, our area will be: ?(102)= 100 ?.

The area of our modified and expanded circle will be: ?(112)= 121 ?.

To find the percentage increase: [(121 ? – 100 ?) / (100 ?)] × 100 = 21%

QUESTION 6

Which of the following paracrine signaling molecules increases gastric acid production in the stomach?

A. Somatostatin

B. Prostaglandins

C. Histamine

D. GIP

E. None of the above

Correct Answer: C

Histamine induces gastric acid secretion in the stomach. Somatostatins inhibit gastric acid secretion, as does GIP.

QUESTION 7

A spring is sitting in an equilibrium position. What would happen to the force of the spring if you pulled the spring to a

length double of that of its equilibrium?

A. Force would half

B. Force would stay the same

C. Force would double

D. Force would quadruple

E. Not enough information is provided

Correct Answer: C

F = -kx; where x = displacement from the equilibrium position Doubling the displacement (x) would double the force (F).

QUESTION 8

Stefan\\'s scores on his English essays were 75, 65, 80, 95, and 65. What is the average of his test scores?

A. 66

B. 71

C. 65

D. 76

Correct Answer: D

(75 + 65 + 80 + 95 + 65) / 5 = 76.

QUESTION 9

Two even integers and one odd integer are multiplied together. Which of the following could be their product?

A. 3.75

B. 9

C. 16.2

D. 24

Correct Answer: D

Integers include all positive and negative whole numbers and the number zero. The product of three integers must be an integer, so you can eliminate any answer choice that is not a whole number: choices

(3.75) and (16.2). The product of two even integers is even. The product of even and odd integers is even. The only even choice is 24.

QUESTION 10

A mythical atom has isotopes: 10X, 11X and 12X with masses 10, 11, and 12 respectively. 10X has an abundance of 80%, 11X of 15% and 12X of 5%. What is the atomic mass of this X atom?

A. 10

B. 10.25

C. 10.75

D. 11

E. 11.25

Correct Answer: B

Logically you should be aware the answer is going to be a low 10 number due to the vast abundance of the 10 atom. However, to calculate it mathematically: (0.80 × 10) + (0.15 × 11) + (0.05 × 12) = 10.25

QUESTION 11

At which trophic level would you find the greatest amount of biomass?

A. Producers

B. Primary Consumers

C. Secondary Consumers

D. Tertiary Consumers

E. Quaternary Consumers

Correct Answer: A

Producers have the greatest amount of biomass, whereas the quaternary consumers have the least amount of biomass. Biomass is lost as you go up the food pyramid.

QUESTION 12

A lead sphere 10 centimeters in diameter is attached to a 10-meter wire and suspended from a beam in a large warehouse. A lead sphere 1 meter in diameter is hung next to the smaller sphere, almost touching. Ignoring friction, which statement is true?

A. The small sphere will move slightly towards the big sphere, but the big sphere will not move.

B. The big sphere will move slightly toward the small sphere, but the small sphere will not move.

C. Neither sphere will move.

D. Both spheres will move slightly towards each other.

Correct Answer: D

There will be a gravitational force of attraction between the two spheres determined by the universal constant of gravity, the distance between the spheres, and the mass of the spheres. Since both objects are affected by this force (remember, Newton\\'s 3rd law says the force needs to be equal and opposite), both objects will experience a slight acceleration and start moving towards each other a tiny amount (when we ignore friction). Using F = ma, you know that the less massive sphere will experience a larger acceleration than the more massive one.

QUESTION 13

Which of the following arises from the mesoderm?

A. Pancreas

B. Lining of digestive system

C. Skin

D. Skeletal muscles

E. Nervous system

Correct Answer: D

The mesoderm gives rise to muscle, bone and connective tissue.

QUESTION 14

Which of the following is incorrect in regards to mitosis and meiosis?

A. Both mitosis and meiosis have 1 round of replication.

B. Meiosis has 2 rounds of division.

C. Mitosis has 1 round of division.

D. There is no crossing over in mitosis.

E. None of the above.

Correct Answer: E

All of the answer choices are indeed correct.

QUESTION 15

Darwin\\'s idea that evolution occurs by the gradual accumulation of small changes can be summarized as:

A. Convergent evolution

B. Adaptive radiation

C. Punctuated equilibrium

D. Phyletic gradualism

E. Sympatric speciation

Correct Answer: D

Phyletic gradualism is the view that evolution occurs at a more or less constant rate. Contrary to this view, punctuated equilibrium holds that evolutionary history consists of long periods of stasis punctuated by geologically short periods of evolution. This theory predicts that there will be few fossils revealing intermediate stages of evolution, whereas phyletic gradualism views the lack of intermediate-stage fossils as a deficit in the fossil record that will resolve when enough specimens are collected.