# College Admission
# Work-Keys
## Work-Keys Certification Exam

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## Question: 1

Max worked the following problem: 6 + 8 + 2. He added 6 and 8 to obtain 14, then divided by 2 to obtain 7. What was his mistake?

A. He did not divide 8 by 2 first.
B. He did not divide both the 6 and the 8 by 2.
C. He did not write the 2 as a fraction.
D. He mistakenly calculated the sum of 6 and 3 as 14 instead of 16.
E. He mistakenly calculated 14 + 2 as 7 instead of 6.

**Answer: A**

Explanation:
The order of operations (PEMDAS) states that division must be performed before addition, unless the addition is within parentheses. So, Max should first divide 8 by 2 to obtain 4, then add it to 6 to obtain 10.

## Question: 2

You plan to build a circular wooden platform with a diameter of 28 feet. You will apply stain to the platform using a product that can cover 225 square feet per gallon. How many gallons will you need to cover the entire platform?

A. 2
B. 3
C. 10
D. 11
E. 12

**Answer: B**

Explanation:

First find the surface area of the platform using the equation for area of a circle:

$$area = 3.14 \times (radius)^2$$
$$= 3.14 \times (14)^2$$
$$= 615.44 \text{ ft.}^2$$

Dividing the area to cover by the area covered by one gallon of stain, $\frac{615.44}{225} = 2.74$ gallons, rounded to 3 gallons.

## Question: 3

A patient was taking 310 mg of antidepressant each day. However, the doctor determined that this dosage was too high and reduced the dosage by a fifth. Further observation revealed the dose was still too high, so he reduced it again by 20 mg. What is the final dosage of the patient's antidepressant?

A. 20 mg
B. 42 mg
C. 228 mg
D. 248 mg
E. 310 mg

**Answer:  C**

Explanation:

To obtain the new dosage, subtract $\frac{1}{5}$ of 310 mg from the original dosage of 310 mg, then subtract 20 mg. $310 \text{ mg} - \left(310 \times \frac{1}{5}\right) \text{ mg} - 20 \text{ mg} = 228 \text{ mg}$

## Question: 4

Curtis is taking a road trip through Germany, where all distance signs are in metric. He passes a sign that states the city of Dusseldorf is 45 kilometers away. Approximately how far is this in miles?

A. 42 miles
B. 37 miles
C. 28 miles
D. 16 miles
E. 12 miles

**Answer:  C**

Explanation:
One kilometer is about 0.62 miles, and 45 (0.62) is 27.9, or approximately 28 miles.

## Question: 5

University Q has an extremely competitive nursing program. Historically, 3/4 of the students in each incoming class major in nursing but only 1/5 of those who major in nursing actually complete the program. If this year's incoming class has 100 students, how many students will complete the nursing program?

A. 75

B. 20
C. 15
D. 5
E. 4

Answer: C

Explanation:

If the incoming class has 100 students, then $\frac{3}{4}$ of those students will major in nursing: $(100)\left(\frac{3}{4}\right) = 75$. So, 75 students will major in nursing but only $\frac{1}{5}$ of that 75 will complete the nursing program: $(75)\left(\frac{1}{5}\right) = 15$. Therefore, 15 students will complete the program.

## Question: 6

If 1 inch on a map represents 60 feet, how many yards apart are two points if the distance between the points on the map is 10 inches?

A. 1,300 yards
B. 600 yards
C. 400 yards
D. 200 yards
E. 2 yards

Answer: D

Explanation:

Start by setting up a proportion to solve by cross multiplication: $\frac{1\ inch}{60\ feet} = \frac{10\ inches}{x\ feet}$. When the numbers are cross multiplied, you get $x = 600$ feet. Now we need to convert 600 feet to yards. There are 3 feet in 1 yard, so divide 600 by 3 to find the number of yards between the two points: $600 \div 3 = 200$. Therefore, the two points are 200 yards apart.

## Question: 7

The graph below shows the weekly church attendance among residents in the town of Ellsford, with the town having five different denominations: Episcopal, Methodist, Baptist, Catholic, and Orthodox. Approximately what percentage of church-goers in Ellsford attends Catholic churches?

**Church Attendance in Ellsford**
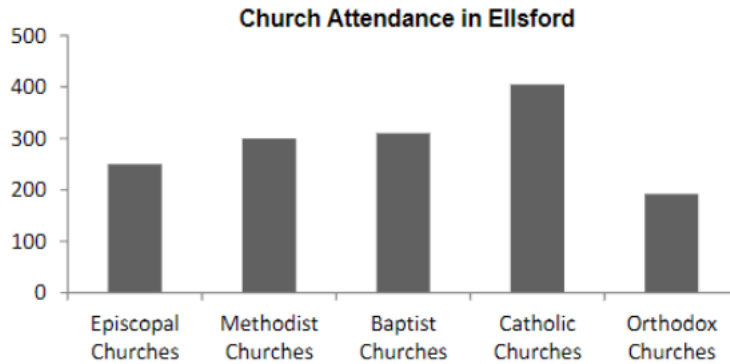


A. 23%
B. 28%
C. 36%
D. 42%
E. 48%

**Answer: B**

Explanation:
Adding up the number of church-goers in Ellsford results in about 1450 residents who attend a church in the town each week. There are approximately 400 people in Ellsford who attend a Catholic church each week. This number represents about 28% of the 1450 church-goers in the town.

## Question: 8

Cheri was solving the following problem: 60 is what percent of 150? She converted the word problem into an equation, writing it as 60 = She then divided both sides by 150 to obtain 60/150 = x. She reduced the fraction to obtain 2/5. Why is this answer wrong?

A. She should have multiplied both sides by 150 instead of dividing.
B. She should have moved the decimal to the left to make it a percent.
C. She should have divided both sides by 60 instead of 150.
D. She should have multiplied both sides by 60.
E. She should have converted the fraction into a percent.

**Answer: E**

Explanation:
The problem asked for the answer as a percent. As a final step, Cheri needs to convert the fraction to a percent by multiplying by 100. This yields 40, so the correct answer is 40%.

## Question: 9

The 5-1b bag of dog food costs $7.45 and the 8-1b bag costs $11.68. How much will it cost James to buy 80 pounds of the less expensive food?

A. $7.45
B. $11.68
C. $116.80
D. $74.50
E. $119.20

| Answer: C |
|---|

Explanation:

To find which dog food is cheaper, we find the unit price (cost per pound) of each. We divide $7.45 by 5 to find that one pound of the first dog food costs $1.49. We divide $11.68 by 8 to find that one pound of the second dog food costs $1.46. Since the 8-1b bag has a lower unit price, we multiply $1.46 by 80 to find that James will pay $116.80.

## Question: 10

A portable concrete mixer can mix 275 pounds of concrete in 30 minutes. Taking the density of concrete as 150 pounds per cubic foot, how long will it take to mix enough concrete to fill wall forms that measure 30' x 8' X 8"?

A. 43.64 hours
B. 523.64 hours
C. 87.27 hours
D. 32.27 hours
E. 12.85 hours

| Answer: A |
|---|

Explanation:

First convert pounds of concrete per minute to cubic feet of concrete per hour:

$$\frac{275 \text{ lb}}{30 \text{ min}} \times \frac{1 \text{ ft}^3}{150 \text{ lb}} \times \frac{60 \text{ min}}{1 \text{ hour}} = 3.66 \text{ ft}^3/\text{hr}$$

Calculate the volume of the forms to be filled:

$$volume = 30 \times 8 \times \frac{8}{12} = 160 \text{ ft}^3$$

Therefore:

$$\frac{1 \text{ hour}}{3.66 \text{ ft}^3} \times 160 \text{ ft}^3 = 43.64 \text{ hours}$$

## Question: 11

The volume of a rectangular box is found by multiplying its length, width, and height. If the dimensions of a box are $\sqrt{3}$, $2\sqrt{5}$, and 4, what is its volume?

A. $2\sqrt{60}$
B. $4\sqrt{15}$
C. $8\sqrt{15}$
D. $24\sqrt{5}$
E. $4\sqrt{30}$

**Answer: C**

Explanation:

The volume of the box is the product of $\sqrt{3}$, $2\sqrt{5}$, and 4. To multiply two or more square root radicals, multiply the coefficients and then multiply the radicands:

$$\sqrt{3} \times 2\sqrt{5} \times 4 = 2\sqrt{15} \times 4 = 8\sqrt{15}$$

## Question: 12

A bullseye with a 4-inch diameter covers 20 percent of a circular target. What is the area, in square inches, of the target?

A bullseye with a 4-inch diameter covers 20 percent of a circular target. What is the area, in square inches, of the target?

A. $0.8\pi$
B. $32\pi$
C. $10\pi$
D. $20\pi$
E. $80\pi$

**Answer: D**

Explanation:

First calculate the area of the bullseye:

$$A = \pi r^2$$
$$= \pi \left(\frac{4 \text{ in}}{2}\right)^2$$
$$= \pi (2 \text{ in})^2$$
$$= 4\pi \text{ in}^2$$

Then, let $x$ = the area of the target. Since 20 percent of $x = 4\pi$

$$0.2x = 4\pi \text{ in}^2$$
$$x = 20\pi \text{ in}^2$$

## Question: 13

Sally wants to buy a used truck for her delivery business. Truck A is priced at $3100 and gets 20 miles per gallon. Truck B costs $4100 and gets 36 miles per gallon. If gasoline costs $2.4 per gallon, how many miles must Sally drive to make truck B the better buy?

A 3000
B. 5400
c. 12600

D. 15650
E. 18750

Explanation:

Let $P_A$ represent the price of truck A and $P_B$ that of truck B. Similarly let $M_A$ and $M_B$ represent the gas mileage obtained by each truck, respectively. The total cost of driving a truck $n$ miles is

$$C = P + n \times \frac{\$2.4}{M}$$

To determine the break-even mileage, set the two cost equations equal to one another and solve for $n$:

$$P_A + n \times \frac{\$2.4}{M_A} = P_B + n \times \frac{\$2.4}{M_B}$$

$$n \times \left(\frac{\$2.4}{M_A} - \frac{\$2.4}{M_B}\right) = P_B - P_A$$

$$n = \frac{P_B - P_A}{\frac{\$2.4}{M_A} - \frac{\$2.4}{M_B}} = \frac{P_B - P_A}{\frac{\$2.4 M_B - \$2.4 M_A}{M_A M_B}} = \frac{M_A M_B (P_B - P_A)}{\$2.4(M_B - M_A)}$$

Plugging in the given values:

$$n = \frac{(20)(36)(4100 - 3100)}{2.4(36 - 20)} = 18750 \text{ miles}$$

## Question: 14

A ski club charges a $48 membership fee, plus $18 to rent ski equipment per day. Which of the following equations can be used to find the total cost of membership at the club, when renting equipment for x days?

A. y = 66x
B. 18x-48
C. y = 48x+18
D. 54x
E. y = 18x+48

Explanation:
The situation can be represented by the slope of 18, since the cost of renting equipment is $18 per day, for x days. The y-intercept is 48 because a member must pay a $48 membership fee, regardless of whether or not ski equipment is rented. Thus, the situation can be represented by the linear equation, y = 18x + 48.

## Question: 15

Pump Alpha can pump at rate of 76 gallons per minute. Pump Bravo can pump at a rate of 212 liters per minute. How many minutes would the fastest pump take to drain a spherical water tank that has an interior diameter of 9 feet?

A. 10.16 min.
B. 28.24 min.

C. 37.55 min.
D. 51.00 min.
E. 76.12 min

<div style="border:1px solid black">**Answer:  C**</div>

Explanation:

The volume of the water tank is calculated using the formula:

$$volume = \frac{4}{3} \times 3.14 \times (radius)^3$$
$$= 4.186 \times (4.5)^3$$
$$= 381.51 \text{ ft.}^3$$

To determine which pump is faster, we need to convert both of their pumping rates into cubic feet per minute. For pump Alpha,

$$\frac{76 \text{ gallons}}{\text{min}} \times \frac{231 \text{ in}^3}{1 \text{ gallon}} \times \frac{1 \text{ ft}^3}{1728 \text{ in}^3} = \frac{10.16 \text{ ft}^3}{\text{min}}$$

For pump Bravo,

$$\frac{212 \text{ liters}}{\text{min}} \times \frac{0.264 \text{ gal}}{1 \text{ liter}} \times \frac{231 \text{ in}^3}{1 \text{ gallon}} \times \frac{1 \text{ ft}^3}{1728 \text{ in}^3} = \frac{7.48 \text{ ft}^3}{\text{min}}$$

Pump Alpha is faster, and it would take $381.51 \text{ ft}^3 \times \frac{1 \text{ min}}{10.16 \text{ ft}^3} = 37.55$ minutes to drain the tank.

# Thank You for Trying Our Product

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