

Choose the option that best answers the question.

If four numbers are randomly selected without replacement from set  $\{1, 2, 3, 4\}$ , what is the probability that the four numbers are selected in ascending order?

- ☐  $1/256$
- ☐  $1/64$
- ☐  $1/48$
- ☐  $1/24$
- ☐  $1/12$

End Practice and See Results

Question 1 of 24

Submit Answer

Next Question

## Text Explanation

If four numbers are randomly selected without replacement from set  $\{1, 2, 3, 4\}$ , what is the probability that the four numbers are selected in ascending order?

- (A)  $\frac{1}{256}$
- (B)  $\frac{1}{64}$
- (C)  $\frac{1}{48}$
- (D)  $\frac{1}{24}$
- (E)  $\frac{1}{12}$
- $$\begin{aligned} &P(1 \rightarrow 2 \rightarrow 3 \rightarrow 4) \\ &= P(1_{\text{first}} \text{ AND } 2_{\text{second}} \text{ AND } 3_{\text{third}} \text{ AND } 4_{\text{fourth}}) \\ &= P(1_{\text{first}}) \times P(2_{\text{second}}) \times P(3_{\text{third}}) \times P(4_{\text{fourth}}) \\ &= \frac{1}{4} \times \frac{1}{3} \times \frac{1}{2} \times 1 \\ &= \frac{1}{24} \end{aligned}$$

Choose the option that best answers the question.

ANIMAL DISTRIBUTION  
AT THE ZOO

Animal	Percent
Lions	32%
Leopards	16%
Ocelots	20%
Tigers	8%
Bobcats	24%

If 8 tigers were added to the zoo, the new ratio of lions to tigers would be 4 to 3. How many bobcats are at the zoo?

- ☐ 4
- ☐ 8
- ☐ 12
- ☐ 24
- ☐ 48

End Practice and See Results

Question 2 of 24

Submit Answer

Next Question

## Text Explanation

If 8 tigers were added to the zoo, the new ratio of lions to tigers would be 4 to 3. How many bobcats are at the zoo?

- (A) 4
- (B) 8
- (C) 12
- (D) 24
- (E) 48

Let  $T$  = Current # of tigers

Let  $L$  = Current # of lions

$$\frac{L}{T} = \frac{32}{8} \Rightarrow 32T = 8L \Rightarrow 4T = L$$

$$\begin{aligned} \frac{L}{T+8} &= \frac{4}{3} \Rightarrow 4(T+8) = 3L \\ 4(T+8) &= 3(4T) \\ 4T + 32 &= 12T \\ 32 &= 8T \\ 4 &= T \end{aligned}$$

ANIMAL DISTRIBUTION  
AT THE ZOO

Animal	Percent
Lions	32%
Leopards	16%
Ocelots	20%
Tigers	8% 4
Bobcats	24% 12

**FAQ:** Don't we need the exact numbers of animals to find the ratio  $L/T$ ? Why can we use just the percents?

It doesn't matter that we're only looking at the percentages. So if Lions are 32% and Tigers are 8%, then if our total number of animals were 100 or 1000 or 10000000 the ratio would still be the same:

Total: 100 Tigers:  $.08 \times 100 = 8$  Lions:  $.32 \times 100 = 32$  Ratio:  $32/8$

Total: 1000 Tigers:  $.08 \times 1000 = 80$  Lions:  $.32 \times 1000 = 320$  Ratio:  $320/80 = 32/8$

Total: 10000 Tigers:  $.08 \times 10000 = 800$  Lions:  $.32 \times 10000 = 3200$  Ratio:  $3200/800 = 32/8$

See how the ratio remains constant? That's because our percentages are based on a common number—the total animals. Even if we don't know that number, the ratio remains the same.

**How can there be 4 tigers? Didn't we add 8?**

In the table, we have percentages of animal population before the new tigers are added. Keep in mind that the question says *if 8 tigers were added to the zoo, the new ratio would be....* This is a hypothetical situation.

So when solving for  $T$ , we are not solving for the number of tigers *after* that hypothetical change; we're solving for the number of tigers represented by 8%. That's 4 tigers, and if we added 8 more there would be 12 of them. Notice that if we used the new number of tigers to find new percentages, the data table would look completely different :-)

Choose the option that best answers the question.

ANIMAL DISTRIBUTION  
AT THE ZOO

Animal	Percent
Lions	32%
Leopards	16%
Ocelots	20%
Tigers	8%
Bobcats	24%

If a pie graph were drawn to scale to represent the animal distribution at the zoo, what would be the measure (in degrees) of the central angle of the sector representing bobcats?

- ☐ 43.2
- ☐ 48
- ☐ 86.4
- ☐ 93.6
- ☐ 96

End Practice and See Results

Question 3 of 24

Submit Answer

Next Question

## Text Explanation

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If a pie graph were drawn to scale to represent the animal distribution at the zoo, what would be the measure (in degrees) of the central angle of the sector representing bobcats?

- (A) 43.2
- (B) 48
- ☒ (C) 86.4
- (D) 93.6
- (E) 96



$$24\% \text{ of } 360 = 90$$

$$24\% \text{ of } 360 = 90^\circ$$

ANIMAL DISTRIBUTION  
AT THE ZOO

Animal	Percent
Lions	32%
Leopards	16%
Ocelots	20%
Tigers	8%
Bobcats	24%

Choose the option that best answers the question.

ANIMAL DISTRIBUTION  
AT THE ZOO

Animal	Percent
Lions	32%
Leopards	16%
Ocelots	20%
Tigers	8%
Bobcats	24%

If there are 44 leopards at the zoo, what is the zoo's total animal population?

- ☐ 225
- ☐ 275
- ☐ 325
- ☐ 350
- ☐ 375

End Practice and See Results

Question 4 of 24

Submit Answer

Next Question

## Text Explanation

If there are 44 leopards at the zoo, what is the zoo's total animal population?

(A) 225      Let  $x$  = total zoo population

(B) 275      16% of  $x = 44$

(C) 325       $\frac{16}{100}x = 44$

(D) 350

(E) 375       $16x = 4400$

$$x = 275$$

ANIMAL DISTRIBUTION  
AT THE ZOO

Animal	Percent
Lions	32%
Leopards	16%
Ocelots	20%
Tigers	8%
Bobcats	24%

Enter the answer in the blank.

7 years ago, Samir was 3 times as old as Deepak. In 4 years, Samir will be twice as old as Deepak. What is Deepak's present age?

End Practice and See Results

Question 5 of 24

Submit Answer

Next Question

## Text Explanation

7 years ago, Samir was 3 times as old as Deepak. In 4 years, Samir will be twice as old as Deepak. What is Deepak's present age?

➡ **18** years

7 years ago	Present	In 4 years
$S - 7$	$S$	$S + 4$
$D - 7$	$D$	$D + 4$

$$S - 7 = 3(D - 7) \rightarrow S - 7 = 3D - 21$$

$$S + 4 = 2(D + 4) \rightarrow S + 4 = 2D + 8$$

$$-11 = D - 29$$

$$18 = D$$



### FAQ: Can I use a single variable approach?

Yes, you can, but it's not very intuitive. Age problems are tricky enough already when different times are involved, and if we tried to streamline these time periods into one variable, it would get more complicated still. That might be the best way to identify when you'd want to/be able to use the one-variable approach. If you can't immediately see how to use a single variable, then *don't*.

If you did use a one-variable approach, you'd be immediately come to some trouble in trying to define Samir's age using  $D$ , because the only info we have is from other time periods. The best was to tack this, then, would be to make  $D$  = Deepak's age **7 years ago**, which has a clearer relationship to Samir's age back then.

Then we'll just add 7 at the end to get Deepak's present age. We can start by again making a table that represents the two ages at each point in time:

7 years ago

Deepak's age:  $D$

Samir's age:  $3D$

Present

Deepak:  $D + 7$

Samir:  $3D + 7$

4 years from now

D's age:  $D + 11$

S's age:  $2(D + 11)$

Now we just need to represent this with an equation. What is one more piece of information that we know that isn't represented by this table?

Well, we know that people age at the same rate. So Samir's age 4 years from now will be 11 more than his age was 7 years ago. So we can write:

$$3D + 11 = 2(D + 11)$$

And then we can solve for  $D$ :

$$3D + 11 = 2(D + 11)$$

$$3D + 11 = 2D + 22$$

$$D + 11 = 22$$

$$D = 11$$

Then, remember that  $D$  = Deepak's age 7 years ago. So that means  $11 + 7 = 18$ , his age now.

Choose the correct statement.

The average (arithmetic mean) of 7 different numbers is 5

Column A	Column B
Median of the 7 numbers	5

- ☐ The quantity in Column A is greater
- ☐ The quantity in Column B is greater
- ☐ The two quantities are equal
- ☐ The relationship cannot be determined from the information given

End Practice and See Results

Question 6 of 24

Submit Answer

Next Question

## Text Explanation

The average (arithmetic mean) of 7 different numbers is 5

Column A		Column B
Median of the 7 numbers	<b>D</b>	5 ✓

Case 1: 2, 3, 4, 5, 6, 7, 8 → median = 5

Case 2: 1, 2, 3, 4, 5, 6, 14 → median = 4

Consider each of the choices separately and select all that apply.

Both P and Q are positive numbers, and S is a negative number. Which of the following fractions could be undefined?

- ☐ P/(Q + S)
- ☐ Q/(P + S)
- ☐ S/(P + Q)
- ☐ Q/(S - P)
- ☐ S/(P - Q)

You must answer the question first.

End Practice and See Results

Question 7 of 24

Submit Answer

Next Question

## Text Explanation

A fraction can only be **undefined** if the denominator equals zero. The value and sign of the numerator does not matter at all. First of all, remember that zero itself is neither positive nor negative, so neither P nor Q nor S could equal zero by itself. The sum [positive] + [positive] can never be zero, but the sum [positive] + [negative] could be zero: (Q + S) and (P + S) could be zero, so fractions **(A)** and **(B)** could be undefined. The differences [positive] - [negative] or [negative] - [positive] can never be zero, but [positive] - [positive] could be zero: (P - Q) could be zero, which means fraction **(E)** could be undefined. Fractions **(A)**, **(B)**, and **(E)** are the only ones that could be undefined.

**FAQ: For answer choice E, how can we assume that P and Q might be equal?**

Good question! The question states that P and Q are both positive numbers which means both are greater than 0; however, there are no other limitations on what P and Q could be. P and Q **could** be equal since the question does not explicitly state that they are not equal.

Choose the option that best answers the question.

The length and width of a rectangular yard are 11 meters and 5 meters respectively. If each dimension were reduced by  $x$  meters to make the ratio of length to width 8 to 3, what would be the value of  $x$ ?

- ☐ 1.4
- ☐ 1.6
- ☐ 1.8
- ☐ 2.0
- ☐ 2.2

End Practice and See Results

Question 8 of 24

Submit Answer

Next Question

### Text Explanation

The length and width of a rectangular yard are 11 meters and 5 meters respectively. If each dimension were reduced by  $x$  meters to make the ratio of length to width 8 to 3, what would be the value of  $x$ ?

- ☒ (A) 1.4
- ☐ (B) 1.6
- ☐ (C) 1.8
- ☐ (D) 2.0
- ☐ (E) 2.2

$$\frac{\text{length}}{\text{width}} : \frac{11-x}{5-x} = \frac{8}{3}$$

$$3(11-x) = 8(5-x)$$

$$33 - 3x = 40 - 8x$$

$$33 + 5x = 40$$

$$5x = 7$$

$$x = 1.4$$

Choose the correct statement.

Column A

Column B

Area of circle with radius  $\sqrt{7}$

Area of circle with diameter

- ☐ The quantity in Column A is greater
- ☐ The quantity in Column B is greater
- ☐ The two quantities are equal
- ☐ The relationship cannot be determined from the information given

End Practice and See Results

Question 9 of 24

Submit Answer

Next Question

## Text Explanation

This is a trick question designed to elicit a particular mistake, and many GRE test takers will fall into this trap. Whenever you find a question like this, it's vitally important to understand and integrate the nature of the trap, so that you don't make the same mistake again. Simply learning to recognize and avoid common traps will put you way ahead of so many other test takers.

To find the area of a circle, we use [Archimedes'](#) remarkable formula:

$$A = \pi r^2$$

Find the area of the first circle is not so bad. Here's the area of the first circle:

$$A = \pi r^2 = \pi(\sqrt{7})^2 = 7\pi$$

Notice that the operation of squaring "undoes" the radical. Most folks can find the area of this circle without too much difficulty.

Now, we are honing in on the place in the problem where folks make a mistake. Many folks think "Well, the other circle has a diameter of radical 14, and we have to divide by 2 to go from diameter to radius, and the first circle has an area of 7 pi, so that must mean they're equal." These people fall for the trap answer of **(C)**, which is not correct.



Let's slow that process down and think about it. We have to divide diameter by 2 to get radius, and then square it in Archimedes' formula. Divide, then square. If, instead, we squared radical 14, then divided by two, we would get 7, and the two columns would be equal. The problem is --- the order of these steps is not negotiable: one order is correct, and the other isn't. Divide, then square ----- that's the correct order. Square, then divide ---- that's 100% incorrect.

Here's the calculation in the correct order. First, we divide that diameter by 2 to get the radius.

$$r = \frac{\sqrt{14}}{2}$$

Notice, we can't simply that fraction at all. This is another place where many folks make a predictable mistake. We can't "divide through the radical" --- that's illegal. We have no choice --- we have to leave it precisely like this.

Now, we plug this radius into Archimedes' formula, to find the area of the circle. In that process, we will square this fraction, and of course squaring a fraction involves squaring both the numerator and the denominator.

$$A = \pi r^2 = \pi \left( \frac{\sqrt{14}}{2} \right)^2 = \pi \left( \frac{14}{4} \right) = \frac{7\pi}{2}$$

As it happens, this second circle has exactly half the area of the first circle. This means, the second circle has *less* area than the first, which means the first column is larger.

Answer = **A**

Choose the option that best answers the question.

When Q is divided by W, the quotient is R and the remainder is E. Which of the following expressions is equal to E?

☐ RW + Q

☐ RW - Q

☐ Q - RW

☐ QW - R

☐  $Q/RW$

End Practice and See Results

Question 10 of 24

Submit Answer

Next Question

## Text Explanation

When  $Q$  is divided by  $W$ , the quotient is  $R$  and the remainder is  $E$ . Which of the following expressions is equal to  $E$ ?

(A)  $RW + Q$

(B)  $RW - Q$

(C)  $Q - RW$

(D)  $QW - R$

(E)  $\frac{Q}{RW}$

If  $a \div b = c(d)$  then  $c \times b + d = a$

$$Q \div W = R(E) \rightarrow RW + E = Q$$

$$E = Q - RW$$

Choose the correct statement.

Four friends win \$120,000 in the lottery, and they divided the winnings in a 1:2:4:5 ratio.

Column A	Column B
The difference between the greatest and least share.	\$40,000

- ☐ The quantity in Column A is greater
- ☐ The quantity in Column B is greater
- ☐ The two quantities are equal
- ☐ The relationship cannot be determined from the information given

End Practice and See Results

Question 11 of 24

Submit Answer

Next Question

## Text Explanation

Four friends win \$120,000 in the lottery, and they divided the winnings in a 1:2:4:5 ratio.

Column A	Column B
The difference between the greatest and least share.	\$40,000
$\$50,000 - \$10,000$	
$\$40,000$	$\$40,000$

$$1:2:4:5 \Rightarrow 1+2+4+5=12$$

$$\$120,000 \div 12 = \$10,000$$

$$1 \rightarrow \$10,000$$

$$2 \rightarrow \$20,000$$

$$4 \rightarrow \$40,000$$

$$5 \rightarrow \$50,000$$

Appleton's population is 400 greater than Berryville's population. If Berryville's population were reduced by 900 people, then Appleton's population would be 3 times as large as Berryville's population. What is Berryville's current population?

- ☐ 1550
- ☐ 1650
- ☐ 1750
- ☐ 1850
- ☐ 1950

End Practice and See Results

Question 12 of 24

Submit Answer

Next Question

## Text Explanation

Appleton's population is 400 greater than Berryville's population. If Berryville's population were reduced by 900 people, then Appleton's population would be 3 times as large as Berryville's population. What is Berryville's current population?

- ☒ (A) 1550
- ☐ (B) 1650
- ☐ (C) 1750
- ☐ (D) 1850
- ☐ (E) 1950

Let  $A$  = Appleton's current population

Let  $B$  = Berryville's current population

$$\left. \begin{array}{l} A = B + 400 \\ A = 3(B - 900) \end{array} \right\} \begin{array}{l} B + 400 = 3(B - 900) \\ B + 400 = 3B - 2700 \\ 400 = 2B - 2700 \\ 3100 = 2B \\ 1550 = B \end{array}$$

Consider each of the choices separately and select all that apply.

Which of the following are equal to  $\left(\frac{1}{560}\right)^{-4}$ ?

Indicate all correct answers.

☐  $\frac{560^5 - 560^4}{559}$

☐  $\frac{560^{-8}}{560^2}$

☐  $70^4 \left(\frac{1}{8}\right)^{-4}$

☐  $\sqrt{560^{16}}$

End Practice and See Results

Question 13 of 24

Submit Answer

Next Question

## Text Explanation

Which of the following are equal to  $\left(\frac{1}{560}\right)^{-4}$ ?  $= 560^4$

Indicate all correct answers.

**A**  $\frac{560^5 - 560^4}{559} = \frac{560^4(560^1 - 1)}{559} = \frac{560^4(559)}{559} = 560^4$

[B]  $\frac{560^{-8}}{560^2} = 560^{-8-2} = 560^{-10}$

**C**  $70^4 \left(\frac{1}{8}\right)^{-4} = 70^4 \left(\frac{8}{1}\right)^4 = 70^4 \times 8^4 = (70 \times 8)^4 = 560^4$

[D]  $\sqrt{560^{16}} = (560^{16})^{\frac{1}{2}} = 560^8$

For more details on the factoring procedure in answer choice **(A)**, see this [GMAT blog](#).

Choose the correct statement.

Column A	Column B
$0.91^8/0.91^9$	1

- ☐ The quantity in Column A is greater
- ☐ The quantity in Column B is greater
- ☐ The two quantities are equal
- ☐ The relationship cannot be determined from the information given

End Practice and See Results      Question 14 of 24      Submit Answer      Next Question

## Text Explanation

Column A	<b>A</b>	Column B
$\frac{0.91^8}{0.91^9}$		1
$0.91^{-1}$	$\frac{x^a}{x^b} = x^{a-b}$	↓
$\frac{1}{0.91}$ ✓		1



Choose the option that best answers the question.

$$\frac{1}{1 + \frac{1}{1 - \frac{1}{3}}} =$$

- ☐ 2/5
- ☐ 4/7
- ☐ 2/3
- ☐ 3/4
- ☐ 5/6

End Practice and See Results

Question 15 of 24

Submit Answer

Next Question

## Text Explanation

$$\frac{1}{1 + \frac{1}{1 - \frac{1}{3}}} =$$

- (A)  $\frac{2}{5}$
- (B)  $\frac{4}{7}$
- (C)  $\frac{2}{3}$
- (D)  $\frac{3}{4}$
- (E)  $\frac{5}{6}$

$$\begin{aligned} \frac{1}{1 + \frac{1}{1 - \frac{1}{3}}} &= \frac{1}{1 + \frac{1}{\frac{2}{3}}} \\ &= \frac{1}{1 + \frac{3}{2}} \\ &= \frac{1}{\frac{2}{2} + \frac{3}{2}} \\ &= \frac{1}{\frac{5}{2}} \\ &= \frac{2}{5} \end{aligned}$$

$$\frac{\frac{1}{a}}{\frac{b}{a}} = \frac{b}{a}$$

Choose the correct statement.

Column A

Column B

$\frac{4}{5}\%$

0.8

- ☐ The quantity in Column A is greater
- ☐ The quantity in Column B is greater
- ☐ The two quantities are equal
- ☐ The relationship cannot be determined from the information given

End Practice and See Results

Question 16 of 24

Submit Answer

Next Question

## Text Explanation

Column A

$$\frac{4}{5}\%$$

0.8%

$$\frac{0.8}{100}$$

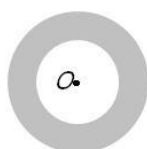
**B**

Column B

0.8 ✓

Choose the option that best answers the question.

Each circle has center  $O$ . The radius of the smaller circle is 2 and the radius of the larger circle is 6. If a point is selected at random from the larger circular region, what is the probability that the point will lie in the shaded region?



- ☐  $\frac{1}{9}$
- ☐  $\frac{1}{6}$
- ☐  $\frac{2}{3}$
- ☐  $\frac{5}{6}$
- ☐  $\frac{8}{9}$

End Practice and See Results

Question 17 of 24

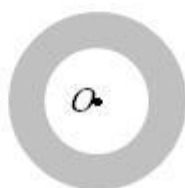
Submit Answer

Next Question

## Text Explanation

Each circle has center  $O$ . The radius of the smaller circle is 2 and the radius of the larger circle is 6. If a point is selected at random from the larger circular region, what is the probability that the point will lie in the shaded region?

- (A)  $\frac{1}{9}$
- (B)  $\frac{1}{6}$
- (C)  $\frac{2}{3}$
- (D)  $\frac{5}{6}$
- (E)  $\frac{8}{9}$



$$\text{Area} = \pi r^2$$

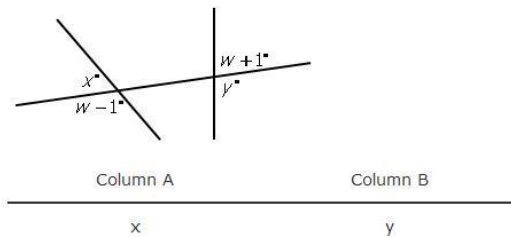
Small circle:  $\text{Area} = \pi(2)^2$   
 $= 4\pi$

Large circle:  $\text{Area} = \pi(6)^2$   
 $= 36\pi$

$$\text{Unshaded portion} = \frac{4\pi}{36\pi} = \frac{1}{9}$$

$$\text{Shaded portion} = \frac{8}{9}$$

Choose the correct statement.



- ☐ The quantity in Column A is greater
- ☐ The quantity in Column B is greater
- ☐ The two quantities are equal
- ☐ The relationship cannot be determined from the information given

End Practice and See Results

Question 18 of 24

Submit Answer

Next Question

## Text Explanation

Column A	<b>A</b>	Column B
$x$		$y$
$180 - (w - 1)$		$180 - (w + 1)$
$181 - w$		$179 - w$
$181$ ✓		$179$

Choose the option that best answers the question.

In the  $xy$ -coordinate system, the distance between points  $(2\sqrt{3}, -\sqrt{2})$  and is approximately

- ☐ 4.1
- ☐ 5.9
- ☐ 6.4
- ☐ 7.7
- ☐ 8.1

End Practice and See Results

Question 19 of 24

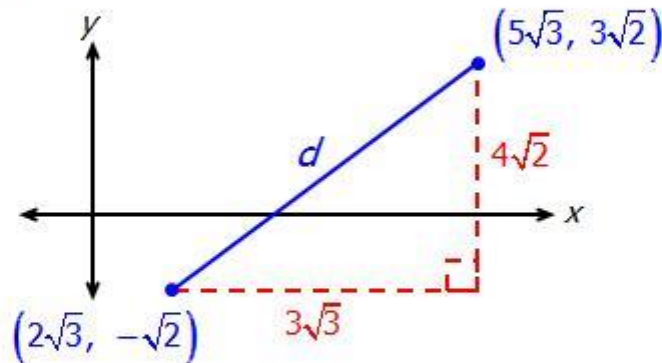
Submit Answer

Next Question

## Text Explanation

In the  $xy$ -coordinate system, the distance between points  $(2\sqrt{3}, -\sqrt{2})$  and  $(5\sqrt{3}, 3\sqrt{2})$  is approximately

- (A) 4.1
- (B) 5.9
- (C) 6.4
- ☒ (D) 7.7
- (E) 8.1



$$(3\sqrt{3})^2 + (4\sqrt{2})^2 = d^2$$

$$27 + 32 = d^2$$

$$59 = d^2$$

$$\sqrt{59} = d \Rightarrow \sqrt{49} < \sqrt{59} < \sqrt{64}$$

Choose the option that best answers the question.

A container holds 4 quarts of alcohol and 4 quarts of water.  
How many quarts of water must be added to the container to  
create a mixture that is 3 parts alcohol to 5 parts water by  
volume?

- ☐ 4/3
- ☐ 5/3
- ☐ 7/3
- ☐ 8/3
- ☐ 10/3

End Practice and See Results

Question 20 of 24

Submit Answer

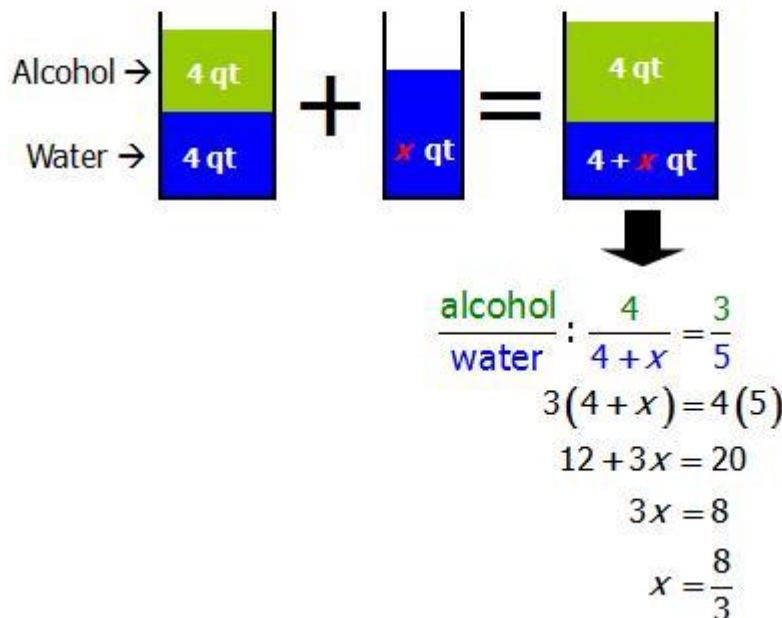
Next Question



## Text Explanation

A container holds 4 quarts of alcohol and 4 quarts of water. How many quarts of water must be added to the container to create a mixture that is 3 parts alcohol to 5 parts water by volume?

- (A)  $\frac{4}{3}$   
 (B)  $\frac{5}{3}$   
 (C)  $\frac{7}{3}$   
 (D)  $\frac{8}{3}$   
 (E)  $\frac{10}{3}$



Choose the option that best answers the question.

If the average (arithmetic mean) of seven consecutive integers is  $k + 2$ , then the product of the greatest and least integer is

- ☐  $k^2 - 9$   
☐  $k^2 - 2k + 1$   
☐  $k^2 + 4k - 12$   
☐  $k^2 + 6k + 9$   
☐  $k^2 + 4k - 5$

End Practice and See Results

Question 21 of 24

Submit Answer

Next Question

## Text Explanation

If the average (arithmetic mean) of seven consecutive integers is  $k + 2$ , then the product of the greatest and least integer is

- (A)  $k^2 - 9$
- (B)  $k^2 - 2k + 1$
- (C)  $k^2 + 4k - 12$
- (D)  $k^2 + 6k + 9$
- ☒ (E)  $k^2 + 4k - 5$

The **mean** of a set of consecutive integers is equal to the **median** of the same set

$$\underline{k-1} \quad \underline{k} \quad \underline{k+1} \quad \underline{k+2} \quad \underline{k+3} \quad \underline{k+4} \quad \underline{k+5}$$

$$(k-1)(k+5) = k^2 + 4k - 5$$

Choose the option that best answers the question.

The average (arithmetic mean) of  $y$  numbers is  $x$ . If 30 is added to the set of numbers, then the average will be  $x - 5$ . What is the value of  $y$  in terms of  $x$ ?

- ☐  $x/7 - 5$
- ☐  $x/6 - 6$
- ☐  $x/6 - 5$
- ☐  $x/5 - 7$
- ☐  $x/5 - 6$

End Practice and See Results

Question 22 of 24

Submit Answer

Next Question

## Text Explanation

The average (arithmetic mean) of  $y$  numbers is  $x$ . If 30 is added to the set of numbers, then the average will be  $x - 5$ . What is the value of  $y$  in terms of  $x$ ?

(A)  $\frac{x}{7} - 5$

If  $m$  is the mean of  $n$  numbers, then the sum of the numbers is  $nm$

(B)  $\frac{x}{6} - 6$

➡ sum of  $y$  numbers =  $xy$

(C)  $\frac{x}{6} - 5$

Add 30 to existing sum

(D)  $\frac{x}{5} - 7$

➡  $\frac{xy + 30}{y + 1} = x - 5$

$$xy + 30 = (x - 5)(y + 1)$$

$$xy + 30 = xy + x - 5y - 5$$

$$xy + 35 = xy + x - 5y$$

$$35 = x - 5y$$

$$5y = x - 35$$

$$y = \frac{x - 35}{5} = \frac{x}{5} - 7$$

(E)  $\frac{x}{5} - 6$

Choose the option that best answers the question.

The  $n$ th term ( $t_n$ ) of a certain sequence is defined as  $t_n = t_{n-1} + 4$ . If  $t_1 = -7$  then  $t_{71} =$

☐ 273

☐ 277

☐ 281

☐ 283

☐ 287

End Practice and See Results

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Submit Answer

Next Question

## Text Explanation

The  $n$ th term ( $t_n$ ) of a certain sequence is defined as  $t_n = t_{n-1} + 4$   
 If  $t_1 = -7$  then  $t_{71} =$

(A) 273

(B) 277

(C) 281

(D) 283

(E) 287

$$t_1 = -7 \text{ (add zero 4's)}$$

$$t_2 = -7 + 4 \text{ (add one 4)}$$

$$t_3 = -7 + 4 + 4 \text{ (add two 4's)}$$

$$t_4 = -7 + 4 + 4 + 4 \text{ (add three 4's)}$$

$$t_5 = -7 + 4 + 4 + 4 + 4 \text{ (add four 4's)}$$

$\vdots$

$$t_{71} = -7 + \underbrace{4 + 4 + 4 + 4 + \dots + 4 + 4 + 4}_{\text{(add seventy 4's)}}$$

$$t_{71} = -7 + (70 \times 4) = -7 + 280 = 273$$

$$t_n = t_{n-1} + 4$$

$$t_{18} = t_{18-1} + 4$$

Choose the option that best answers the question.

If A, B and C represent different digits in the multiplication,  
 then  $A + B + C =$

$$\begin{array}{r} A A B \\ \times \quad B \\ \hline C B 5 B \end{array}$$

☐ 9

☐ 12

☐ 14

☐ 15

☐ 17

End Practice and See Results

Question 24 of 24

Submit Answer

View Results



Text Explain  全屏看图  保存  发送到 

$$\begin{array}{r} A A 6 \\ \times \quad 6 \\ \hline C 6 5 6 \end{array} \quad A = 7 \quad \begin{array}{r} 7 7 6 \\ \times \quad 6 \\ \hline 4 6 5 6 \end{array}$$

If  $A$ ,  $B$  and  $C$  represent different digits in the above multiplication, then  $A+B+C =$

(A) 9

(B) 12

(C) 14

(D) 15

(E) 17

$$B = \cancel{0}, \cancel{1}, \cancel{5} \text{ or } 6 \Rightarrow B = 6$$

$$A = 2 \text{ or } 7 \Rightarrow A = 7$$

$$C = 4$$

$$\begin{aligned} A + B + C &= 7 + 6 + 4 \\ &= 17 \end{aligned}$$

The first thing we should note is the role of  $B$ —it's the units digit of both factors and of the product. So, it must be a number that we can square and result in a units digit that equals the number that we squared. That's a mouthful. Let's see some examples.

$$0 * 0 = 0$$

$$1 * 1 = 1$$

This is a very common trick on variables-for-digits questions like this, and it's good to know (without doing the math) that the four possible digits that result in a number with the same units digit when squared are 0, 1, 5, and 6.

If you didn't know that immediately, then check:

$$2 * 2 = 4 \text{ [no good]}$$

$$3 * 3 = 9 \text{ [no good]}$$

$$4 * 4 = 16 \text{ [no good]}$$

$$5 * 5 = 25$$

$$6 * 6 = 36$$

$$7 * 7 = 49 \text{ [no good]}$$

$$8 * 8 = 64 \text{ [no good]}$$

$$9 * 9 = 81 \text{ [no good]}$$

At this point we have four numbers to test.  $B = 0$  is impossible— $CB5B$  would have to equal 0. Similarly,  $B = 1$  is impossible, because then the product would have to be a three digit number equal to  $AAB$ , not a four digit number.

So what if  $B = 5$ ? When we multiply those 5s in the units, we get 25. So that works. No carry the 2 next to the A. Now we know  $(5 * A) + 2$  that *again* results in 5. No value of A is possible for this; we'll always end up with a 7 or a 2. For example,

$$(5 * 2) + 2 = 12$$

$$(5 * 3) + 2 = 17$$

So B can't be 5. It must be 6!

Now, given  $B = 6$ , so  $6 * 6 = 36$ . That means  $(6 * A) + 3$  must give us a number that ends in 5. Let's experiment,

$$(6 * 2) + 3 = 15$$

$$(6 * 3) + 3 = 21 \text{ [no good]}$$

$$(6 * 4) + 3 = 27 \text{ [no good]}$$

$$(6 * 7) + 3 = 45$$

That means that either  $A = 2$  or  $A = 7$ . When we add that 3 (carried from  $6 * 6 = 36$ ), we get a tens digit in the product that equals 5.

It turns out that  $A = 2$  doesn't work because of the A in the hundreds place and the B in the product. If A were 2 then B would have to be 3. For example,

$$(2 * 6) + 1 = 13$$

We already know that B must be 6 so we can eliminate 2 as a possibility. So  $A = 7$  and we can solve the problem.

**$A = 7$ ,  $B = 6$ , and  $C = 4$ , so  $A + B + C = 17$**

**FAQ: How do we start assuming in the first place? How do we end up with 0, 1, 5, and 6?**

**A:** In part, this solution is about having good number sense. This is something that develops over time as you notice patterns with numbers. Check out more on this here:

<http://gre.magoosh.com/lessons/909-number-sense>

<http://magoosh.com/gmat/2012/number-sense-for-the-gmat/>