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Problem Solving

INSTRUCTIONS

Solve the problem and indicate the best of the answer choices given.

Numbers: All numbers used are real numbers.

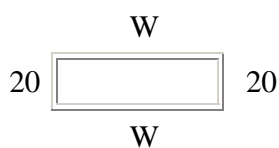
Figures: A figure accompanying a problem solving a question is intended to provide information useful in solving the problem. Figures are drawn as accurately as possible EXCEPT when it is stated in a specific problem that its figure is not drawn to scale. Straight lines may sometimes appear jagged. All figures lie in a plane unless otherwise indicated.

Problem Solving Question 1

Harriet wants to put up fencing around three sides of her rectangular yard and leave a side of 20 feet unfenced. If the yard has an area of 680 square feet, how many feet of fencing does she need?

- 34
- 40
- 68
- 88
- 102

EXPLANATION



The diagram shows the rectangular yard with the known dimension, 20 feet, and the unknown dimension, w feet. The area of the yard is $20w = 680$ square feet, so $w = 680 / 20 = 34$ feet. The length of the fencing needed is $34 + 20 + 34 = 88$ feet.

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Problem Solving Question 2

A toy store regularly sells all stock at a discount of 20 percent to 40 percent. If an additional 25 percent were deducted from the discount price during a special sale, what would be the lowest possible price of a toy costing \$16 before any discount?

- \$5.60
- \$7.20
- \$8.80
- \$9.60
- \$15.20

EXPLANATION

The lowest possible price is paid when the maximum discount is received, so the lowest possible regular price is $\$16 - 0.40(\$16) = \$9.60$. With an additional 25 percent discount, the lowest possible price is $\$9.60 - 0.25(\$9.60) = \$7.20$. The best answer is the second one.

Alternatively, the lowest possible price to be paid for the item can be calculated by realizing that if you are being given a discount of 40 percent you are paying 60 percent of the listed price of the item. If an additional 25 percent discount is offered on the item, the price of the item becomes $(0.75)(0.60)(\$16) = \7.20 .

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Problem Solving Question 3

Which of the following equations has a root in common with $x^2 - 6x + 5 = 0$?

- $x^2 + 1 = 0$
- $x^2 - x - 2 = 0$
- $x^2 - 10x - 5 = 0$
- $2x^2 - 2 = 0$
- $x^2 - 2x - 3 = 0$

EXPLANATION

Since $x^2 - 6x + 5 = (x - 5)(x - 1)$, the roots of $x^2 - 6x + 5 = 0$ are 1 and 5. When these two values are substituted in each of the five choices to determine whether or not they satisfy the equation, only in the fourth choice does a value satisfy the equation, namely, $2(1)^2 - 2 = 0$. Thus the best answer is $2x^2 - 2 = 0$.

Problem Solving Question 4

If "basis points" are defined so that 1 percent is equal to 100 basis points, then 82.5 percent is how many basis points greater than 62.5 percent?

- .02
- .2
- 20
- 200
- 2,000

EXPLANATION

There is a difference of 20 percent between 82.5 percent and 62.5 percent. If 1 percent equals 100 basis points, then 20 percent equals $20(100)$ or 2,000 basis points.

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Problem Solving Question 5

If $x + 5y = 16$ and $x = -3y$, then $y =$

- 24
- 8
- 2
- 2
- 8

EXPLANATION

Substitution of the second equation into the first equation yields

$$(-3y) + 5y = 16$$

$$2y = 16$$

$$y = 8$$