

Use this space for
computations.

1 If $f(x) = \frac{1}{2}x^2 - \left(\frac{1}{4}x + 3\right)$, what is the value of $f(8)$?

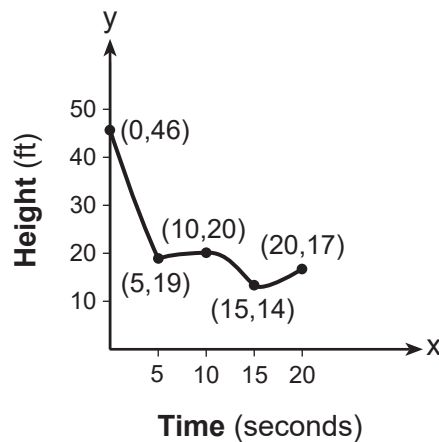
(1) 11

(3) 27

(2) 17

(4) 33

2 The graph below models the height of a remote-control helicopter over 20 seconds during flight.



Over which interval does the helicopter have the *slowest* average rate of change?

(1) 0 to 5 seconds

(3) 10 to 15 seconds

(2) 5 to 10 seconds

(4) 15 to 20 seconds

3 In the functions $f(x) = kx^2$ and $g(x) = |kx|$, k is a positive integer.

If k is replaced by $\frac{1}{2}$, which statement about these new functions is true?

(1) The graphs of both $f(x)$ and $g(x)$ become wider.

(2) The graph of $f(x)$ becomes narrower and the graph of $g(x)$ shifts left.

(3) The graphs of both $f(x)$ and $g(x)$ shift vertically.

(4) The graph of $f(x)$ shifts left and the graph of $g(x)$ becomes wider.

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- 4 Olivia entered a baking contest. As part of the contest, she needs to demonstrate how to measure a gallon of milk if she only has a teaspoon measure. She converts the measurement using the ratios below:

$$\frac{4 \text{ quarts}}{1 \text{ gallon}} \cdot \frac{2 \text{ pints}}{1 \text{ quart}} \cdot \frac{2 \text{ cups}}{1 \text{ pint}} \cdot \frac{\frac{1}{4} \text{ cup}}{4 \text{ tablespoons}} \cdot \frac{3 \text{ teaspoons}}{1 \text{ tablespoon}}$$

Which ratio is *incorrectly* written in Olivia's conversion?

- (1) $\frac{4 \text{ quarts}}{1 \text{ gallon}}$ (3) $\frac{\frac{1}{4} \text{ cup}}{4 \text{ tablespoons}}$
(2) $\frac{2 \text{ pints}}{1 \text{ quart}}$ (4) $\frac{3 \text{ teaspoons}}{1 \text{ tablespoon}}$

- 5 If $y = 3x^3 + x^2 - 5$ and $z = x^2 - 12$, which polynomial is equivalent to $2(y + z)$?

- (1) $6x^3 + 4x^2 - 34$ (3) $6x^3 + 3x^2 - 22$
(2) $6x^3 + 3x^2 - 17$ (4) $6x^3 + 2x^2 - 17$

- 6 An outdoor club conducted a survey of its members. The members were asked to state their preference between skiing and snowboarding. Each member had to pick one. Of the 60 males, 45 stated they preferred to snowboard. Twenty-two of the 60 females preferred to ski. What is the relative frequency that a male prefers to ski?

- (1) 0.125 (3) $\overline{0.333}$
(2) 0.25 (4) $\overline{0.405}$