(5) At an interest rate r, compounded n times per year, the effective annual yield or annual percentage rate (APR), is given by the formula $APR = \left(1 + \dfrac{r}{n}\right)^n - 1$.

1. Carl deposited P dollars into a savings account that earned 8 percent annual interest, compounded semiannually. Carl made no additional deposits to or withdrawals from the account. After one year, the account had a total value of $10,816. What was the value of P ?

(A)   9,600
(B) 10,000
(C) 10,800
(D) 12,000

B

2 cm

A C
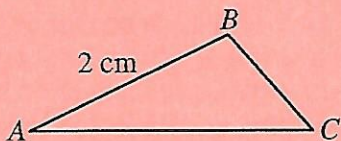
2. Triangle DEF (not shown) is similar to $\triangle ABC$ shown, with angle B congruent to angle E and angle C congruent to angle F. The length of side DE is 6 cm. If the area of $\triangle ABC$ is 5 square centimeters, what is the area of $\triangle DEF$?

(A) 10 cm²
(B) 12 cm²
(C) 18 cm²
(D) 45 cm²

3. m is an odd integer. For each of the following numbers, indicate whether the number is odd or even.

Number	Odd	Even
$2m - 1$		
$2m + 1$		
$m^2 - m$		
$m^2 + m + 1$		

Click on your choices.

4. Which of the following statements is NOT true for all real numbers a and b ?

(A) $(a+b)^2 - (a-b)^2 = 4ab$
(B) $(a-b)(a+b) = a^2 - b^2$
(C) $(a+b)^3 = a^3 + 3a^2 b + 3ab^2 + b^3$
(D) $a^3 - b^3 = (a + b^2)(a^2 - b)$

5. For any positive integers a and b, the operation $\otimes$ is defined as $a \otimes b = (2a - 1)^{b-1}$. What is the value of $(2 \otimes 2) \otimes 3$?

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6. A company manufactures electronic components that each must weigh from 29.5 grams to 30.5 grams, inclusive. Which of the following inequalities describes all acceptable weights x, in grams, for each component?

(A) $|30 - x| \le 0.5$
(B) $|30 - x| > 0.5$
(C) $30 - x \le 0.5$
(D) $30 - x > 0.5$

7. Assume that x is the standard deviation of the set of the nonzero numbers $\{a, b, c, d, e\}$. For each of the following sets, indicate which sets must have a standard deviation equal to x .

Set	Must Have Standard Deviation Equal to x
$\{a+2,\ b+2,\ c+2,\ d+2,\ e+2\}$	
$\{a-2,\ b-2,\ c-2,\ d-2,\ e-2\}$	
$\{2a,\ 2b,\ 2c,\ 2d,\ 2e\}$	
$\left\{\dfrac{a}{2}, \dfrac{b}{2}, \dfrac{c}{2}, \dfrac{d}{2}, \dfrac{e}{2}\right\}$	

Click on your choices.