

Define  $a@b = ab - b^2$  and  $a\#b = a + b - ab^2$ . What is  $\frac{6@2}{6\#2}$ ?

- (A)  $-\frac{1}{2}$     (B)  $-\frac{1}{4}$     (C)  $\frac{1}{8}$     (D)  $\frac{1}{4}$     (E)  $\frac{1}{2}$

**2007 AMC 10 A, Problem #2—**

**“Set up the two equations with  $a = 6$ , and  $b = 2$ ”**

**Solution**

**Answer (A):** The value of  $6@2$  is  $6 \cdot 2 - 2^2 = 12 - 4 = 8$ , and the value of  $6\#2$  is  $6 + 2 - 6 \cdot 2^2 = 8 - 24 = -16$ . Thus

$$\frac{6@2}{6\#2} = \frac{8}{-16} = -\frac{1}{2}.$$

**Difficulty:** Medium-easy

**NCTM Standard:** Algebra Standard: Understand patterns, relations, and functions.

**Mathworld.com Classification:** Algebra > Algebraic Operations > General Algebraic Operations > Binary Operation