

If c is a negative integer and d is a positive integer, which of the following must have a positive value?

A. $(c * d)^3$

B. $c^2 * d^3$

C. $c^3 * (-d)^2$

D. $(-c(-d))^3$

Key facts: sign rules when multiplying:

$$(+)*(+)=+$$

$$(+)*(-)=-$$

$$(-)*(+)=-$$

$$(-)*(-)=+$$

Order of operations: parenthesis first, then exponents, then multiplication.

Keeping track of exponents: second power, third power.

Solution 1: Use sample numbers that are easy to work with (not 0 as it is often a special case)

$$c = -1 \quad d = 2$$

A. $(-1 * 2)^3 = (-2)^3 = -8 \quad \ominus$

B. $(-1)^2 * (2)^3 = 1 * 8 = 8 \quad \oplus \quad \checkmark$

C. $(-1)^3 * (-2)^2 = -1 * 4 = -4 \quad \ominus$

D. $(-(-1)(-2))^3 = (-2)^3 = -8 \quad \ominus$

Solution 2: Use sign rule to get a generalized solution

$$c = (-) \quad d = (+)$$

A. $((-)*(+))^3 = (-)^3 = \ominus$

B. $(-)^2 * (+)^3 = (+)*(+)=\oplus \quad \checkmark$

C. $(-)^3 * (-(+))^2 = (-)*(+)=\ominus$

D. $(-(-)(-(+)))^3 = (-(+))^3 = (-)^3 = \ominus$