

Topic: Multiplying scientific notation**Question:** Rewrite the expression in scientific notation.

$$(2 \times 10^8)(3.4 \times 10^{-2})$$

Answer choices:

- A 0.068×10^7
- B 6.8×10^6
- C 0.68×10^5
- D 68×10^6



Solution: B

We'll multiply the decimal numbers and the powers of 10 separately, remembering that we have to add the exponents in the latter multiplication.

$$(2 \times 10^8)(3.4 \times 10^{-2})$$

$$(2 \times 3.4)(10^8 \times 10^{-2})$$

$$6.8 \times 10^{8+(-2)}$$

$$6.8 \times 10^{8-2}$$

$$6.8 \times 10^6$$



Topic: Multiplying scientific notation**Question:** Rewrite the expression in scientific notation.

$$(2,000)(40)(1.2 \times 10^7)$$

Answer choices:

- A 10×10^6
- B 9.2×10^3
- C 9.6×10^{11}
- D 8×10^3



Solution: C

Only the third number in this multiplication includes a power of 10 (the 10^7 in 1.2×10^7), so for the time being we'll leave that 10^7 alone and multiply everything else.

$$(2,000)(40)(1.2 \times 10^7)$$

$$80,000(1.2 \times 10^7)$$

$$(80,000 \times 1.2) \times 10^7$$

$$96,000 \times 10^7$$

In order to write this in scientific notation, we have to express 96,000 as only one digit in the ones (units) place, and one digit in the tenths place. We need to think of 96,000 as 96,000.0 in order to realize that we need to move the decimal four places to the left in order to get 9.6. So we'll change the expression to

$$9.6 \times 10^4 \times 10^7$$

$$9.6 \times 10^{4+7}$$

$$9.6 \times 10^{11}$$



Topic: Multiplying scientific notation**Question:** Rewrite the expression in scientific notation.

$$(26 \times 10^2)(200 \times 10^{-8})$$

Answer choices:

- A 5.2×10^9
- B 5.2×10^{-3}
- C 5.2×10^{-4}
- D 2.6×10^{-3}



Solution: B

We'll multiply the whole numbers together, and then separately multiply the powers of 10, remembering that we have to add the exponents.

$$(26 \times 10^2)(200 \times 10^{-8})$$

$$(26 \times 200)(10^2 \times 10^{-8})$$

$$5,200 \times 10^{2+(-8)}$$

$$5,200 \times 10^{2-8}$$

$$5,200 \times 10^{-6}$$

In proper scientific notation, we only leave one digit to the left of the decimal point in the first number, so 5,200 needs to become 5.2. In order to do that, we have to move the decimal point three places to the left, which means we'll also have to multiply by 10^3 .

$$5.2 \times 10^3 \times 10^{-6}$$

$$5.2 \times 10^{3+(-6)}$$

$$5.2 \times 10^{3-6}$$

$$5.2 \times 10^{-3}$$

