Topic: Dividing scientific notation

Question: Rewrite the expression in scientific notation.

$$(9.88 \times 10^{12}) \div (2.6 \times 10^{-3})$$

Answer choices:

A 3.8×10^{15}

B 3.75×10^{16}

C 3.8×10^{-15}

D 3.8×10^{9}

Solution: A

The given expression is

$$(9.88 \times 10^{12}) \div (2.6 \times 10^{-3})$$

First, we divide the decimal numbers and the powers of 10 separately, remembering to subtract the exponents in the latter division.

For the division of the decimal numbers, we get

$$9.88 \div 2.6 = 3.8$$

Dividing the powers of 10:

$$10^{12} \div 10^{-3} = 10^{12-(-3)} = 10^{12+3} = 10^{15}$$

Next, we multiply the results of those two divisions.

$$3.8 \times 10^{15}$$

Topic: Dividing scientific notation

Question: Rewrite the expression in scientific notation.

$$(1.554 \times 10^{-6}) \div (2.1 \times 10^{5})$$

Answer choices:

A 3.3×10^{-11}

B 7.4×10^{-11}

C 3.3×10^{11}

D 7.4×10^{-12}

Solution: D

The given expression is

$$(1.554 \times 10^{-6}) \div (2.1 \times 10^{5})$$

First, we divide the decimal numbers and the powers of 10 separately, remembering to subtract the exponents.

For the division of the decimal numbers, we get

$$1.554 \div 21 = 0.74$$

Dividing the powers of 10:

$$10^{-6} \div 10^{5} = 10^{-6-5} = 10^{-11}$$

Next, we multiply the results of those two divisions.

$$0.74 \times 10^{-11}$$

The number we just found (0.74×10^{-11}) isn't in proper scientific notation, because in 0.74 the digit to the left of the decimal point is 0.

To take care of that, we'll express 0.74 in proper scientific notation. To get just one nonzero digit to the left of the decimal point, we have to move the decimal point one place to the right, so the exponent will be -1.

$$0.74 = 7.4 \times 10^{-1}$$

Finally, we'll multiply 7.4×10^{-1} by the result of the division of the powers of 10 (by 10^{-11}), so we need to add the exponents.

$(7.4 \times 10^{-1}) \times 10^{-11}$

$7.4 \times (10^{-1} \times 10^{-11})$

$7.4 \times 10^{-1+(-11)}$

$7.4 \times 10^{-1-11}$

7.4×10^{-12}

Topic: Dividing scientific notation

Question: Rewrite the expression in scientific notation.

$$\frac{3.6 \times 10^3}{1.6 \times 10^6}$$

Answer choices:

A 2.25×10^{-3}

B 5.76×10^{-3}

C 5.76×10^{9}

D 2.25×10^{9}

Solution: A

Divide the decimal numbers, separately from the powers of 10.

$$\frac{3.6}{1.6} \times \frac{10^3}{10^6}$$

$$2.25 \times \frac{10^3}{10^6}$$

To divide the powers of 10, subtract the exponent in the denominator from the exponent in the numerator.

$$2.25 \times 10^{3-6}$$

$$2.25 \times 10^{-3}$$