Topic: What is a logarithm?

Question: What question is the equation posing?

$$\log_6(216) = x$$

Answer choices:

A If you raise 6 to the 216th power, what will you get?

B If you raise 216 to the 6th power, what will you get?

C To what power do you have to raise 216 in order to get 6?

D To what power do you have to raise 6 in order to get 216?

Solution: D

In the logarithmic equation $\log_6(216) = x$,

6 is the base,

216 is the argument of the log function, and

x is the exponent

The logarithm always makes the statement

"The base must be raised to the exponent in order to get the argument."

Because the exponent is the quantity that's unknown, that means we're asking

"To what power do you have to raise 6 in order to get 216?"

Topic: What is a logarithm?

Question: Use the general log rule to solve the equation.

$$\log_8(x) = 4$$

Answer choices:

A $x = 2$

B $x = 4$

C $x = 32$

D $x = 4{,}096$

Solution: D

If we use the general log rule to convert the given equation ($\log_8(x) = 4$) to its exponential form, we get

$$8^4 = x$$

$$8 \cdot 8 \cdot 8 \cdot 8 = x$$

$$64 \cdot 64 = x$$

$$4{,}096 = x$$

Topic: What is a logarithm?

Question: Use the general log rule to convert the exponential equation to its logarithmic form.

$$7^x = 343$$

Answer choices:

A $\log_7(x) = 343$

B $\log_{343}(x) = 7$

C $\log_7(343) = x$

D $\log_{343}(7) = x$

Solution: C

If we match the quantities in the exponential equation $7^x = 343$ to those in the general exponential equation $a^x = y$, we see that

$$a = 7$$

$$y = 343$$

If we plug these values into the logarithmic form of this equation from the general log rule ($\log_a(y) = x$), we get

$$\log_7(343) = x$$