

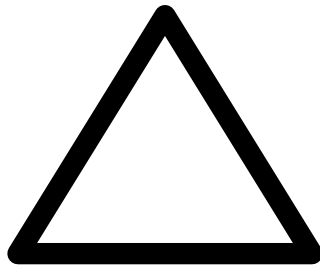
Problem

Simplify: $x^8 \cdot x^2$

Incorrect Work/Answer

$$\begin{aligned}x^8 \cdot x^2 \\ = x^{16}\end{aligned}$$

- A) The person multiplied the exponents.
- B) The person saw the multiplication sign, so they multiplied the exponents.
- C) Add the exponents. Correct answer: x^{10} .



Problem

Simplify: $(3x^2)^4$

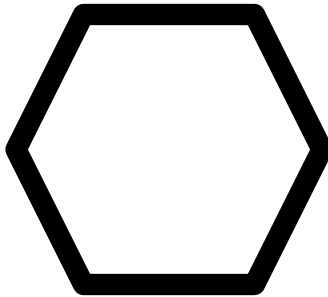
Incorrect Work/Answer

$$(3x^2)^4$$
$$= 12x^8$$

A) The person multiplied the coefficient (3) by the exponent.

B) Since you are supposed to multiply the exponents, it might be easy to treat the coefficient the same way.

C) Take 3 to the 4th power. Correct answer: $81x^8$



Problem

Simplify: $\frac{10x^7}{5x^4}$

Incorrect Work/Answer

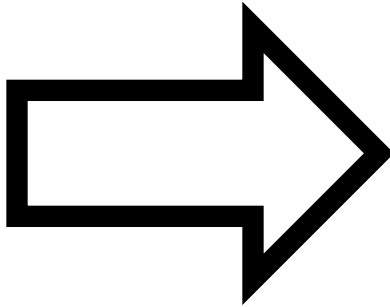
A) The person subtracted the coefficients.

$$\frac{10x^7}{5x^4}$$

B) Since you subtract the exponents, it might be easy to forget and treat the coefficients the same way.

$$= 5x^3$$

C) Treat the coefficients like normal numbers, so divide them. Correct answer = $2x^3$



Problem

Simplify: $\frac{3^6}{3^2}$

Incorrect Work/Answer

A) The person divided the bases.

B) The person did not realize that the 3 is a base, not a coefficient. The base is usually a variable instead of a number, so they got confused.

$$\frac{3^6}{3^2} = 1^4$$

C) You are supposed to keep the base the same.
Correct answer: 3^4



Problem

Evaluate the power: -2^6

Incorrect Work/Answer

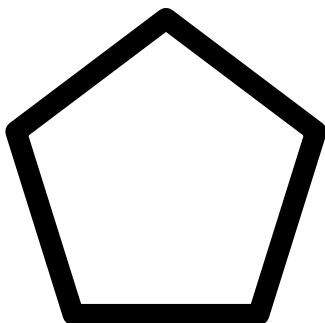
$$-2^6$$

$$= -2 \cdot -2 \cdot -2 \cdot -2 \cdot -2 \cdot -2$$

A) The person expanded the negative sign every time even though the negative sign is not connected to the exponent. $= 64$

B) It LOOKS like -2 to the 6th power.

C) Expand the 2 six times, then put a negative sign out front. $-2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 = -64$



Problem

Evaluate the power: 5^{-3}

Incorrect Work/Answer

$$5^{-3}$$

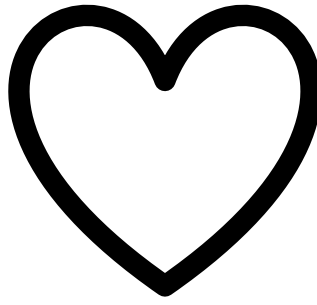
$$= -125$$

A) The person took 5 to the 3rd power and then made the answer negative.

B) The person probably thought that a negative exponent just makes your answer negative.

C) A negative exponent makes your answer a

fraction. Correct answer: $\frac{1}{125}$



Problem

Simplify: $(xy^{10})^3$

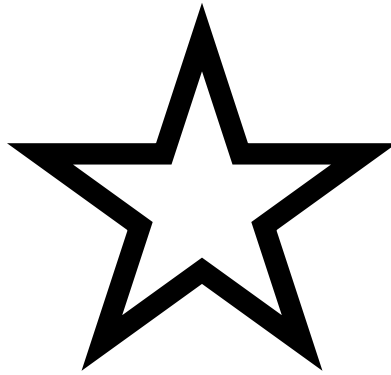
Incorrect Work/Answer

A) The person multiplied the y exponent correctly but forgot about the x.

B) There is no exponent on the x, so it is easy to forget about it.

C) Remember that x means x^1 . Multiply the 1 with the 3. Correct answer: x^3y^{30}

$$\begin{aligned} &(xy^{10})^3 \\ &= xy^{30} \end{aligned}$$



Problem

Evaluate the power: 3^{-4}

Incorrect Work/Answer

$$3^{-4}$$

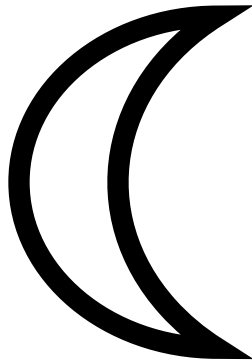
$$\underbrace{3.}$$

$$=.0003$$

A) The person treated the problem like it was scientific notation. You only move the decimal when you're dividing by 10.

B) The person thought that the "move the decimal" trick works for every negative exponent instead of just scientific notation.

C) It should be $\frac{1}{3^4}$. Correct answer: $\frac{1}{81}$



Problem

Simplify: $10p^{-5}$

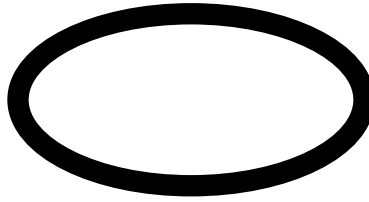
Incorrect Work/Answer

$$\frac{1}{10p^5}$$

A) The person moved the 10 to the denominator, but it is supposed to stay in the numerator.

B) The person thought the exponent (-5) was attached to the p and the 10, but it is just attached to the p.

C) Correct answer: $\frac{10}{p^5}$



Problem

Simplify: $\frac{a^7 b^5}{a^5 b^7}$

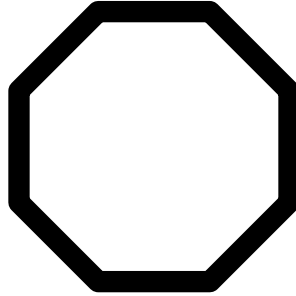
Incorrect Work/Answer

$$\frac{\cancel{a} \cdot \cancel{a} \cdot \cancel{a} \cdot \cancel{a} \cdot \cancel{a} \cdot a \cdot a \cdot \cancel{b} \cdot \cancel{b} \cdot \cancel{b} \cdot \cancel{b} \cdot \cancel{b}}{\cancel{a} \cdot \cancel{a} \cdot \cancel{a} \cdot \cancel{a} \cdot \cancel{a} \cdot b \cdot b \cdot \cancel{b} \cdot \cancel{b} \cdot \cancel{b} \cdot \cancel{b} \cdot \cancel{b}} = a^2 b^2$$

A) The person subtracted the “b” exponents in the wrong order.

B) The person either thought that the order of subtraction didn’t matter, or they didn’t realize that the “extra” b’s are in the denominator after you expand & cancel the b’s.

C) Should be $\frac{a^2}{b^2}$



Problem

Add: $(2.5 \times 10^4) + (1.2 \times 10^2)$

Incorrect Work/Answer

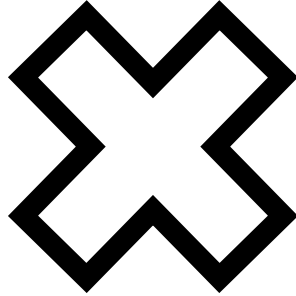
$$(2.5 \times 10^4) + (1.2 \times 10^2)$$

$$= 3.7 \times 10^6$$

A) The person used a shortcut for adding in scientific notation, but there isn't one.

B) Since there is a shortcut for multiplying & dividing in scientific notation, they tried to do a similar shortcut.

C) Expand both to $25000 + 120$, which is 25120 . Correct answer: 2.512×10^4



Problem

Write in standard notation: 7.2×10^3

Incorrect Work/Answer

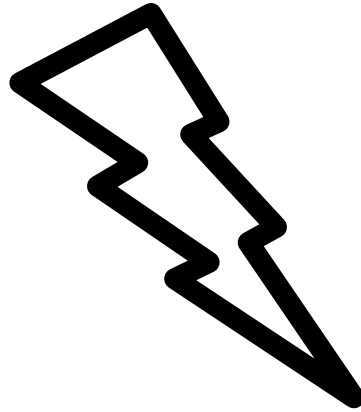
$$7.2 \times 10^3$$

$$= 72000$$

A) The person added too many zeroes.

B) The person probably thought that the exponent tells you how many zeroes there are.

C) You only need 2 zeroes, since the first time you multiply you get 72. Correct answer: 7200



Problem

Divide: $\frac{6 \times 10^7}{1.5 \times 10^{-2}}$

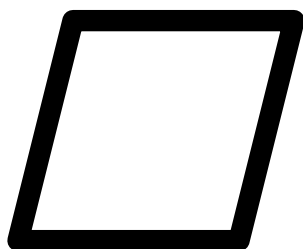
Incorrect Work/Answer

$$\frac{6 \times 10^7}{1.5 \times 10^{-2}} = 4 \times 10^5$$

A) The person subtracted the exponents incorrectly.

B) The person saw the 7 and the -2 and just put them together: 7 - 2.

C) It should be $7 - (-2)$, which is the same as $7 + 2$. Correct answer: 4×10^9



Problem

Write in standard notation: 6×10^{-2}

Incorrect Work/Answer

$$6 \times 10^{-2}$$

$$=.006$$

- A) The person wrote too many zeroes.
B) The person probably put the decimal to the left of the 6 and then moved it 2 spaces. Or they thought that the exponent automatically tells you how many zeroes to put.
C) The decimal starts to the right of the 6, then moves left 2 spaces.

Correct answer: **.06**