

7.2A Power Properties: The Sequel

#1 – 6: Multiple choice: Circle the correct answer

1. Which one of the expressions is NOT the same as 6^{-2} ?
 [A] $\frac{1}{6^{-2}}$
 [B] $\left(\frac{1}{6}\right)^2$
 [C] $\frac{1}{6^2}$
2. Which of the following has the greatest value?
 [A] 5^{-2}
 [B] $(-2)^0$
 [C] 2^1
3. Evaluate $(3^{-2})^{-1}$
 [A] 9
 [B] $\frac{1}{9}$
 [C] $\frac{1}{27}$
4. Simplify 4^{-2}
 [A] -8
 [B] $\frac{1}{16}$
 [C] $\frac{1}{8}$
5. Simplify $3^2 + 3^4$
 [A] 90
 [B] 729
 [C] 6561
6. Which power has the value 16?
 [A] 8^2
 [B] 4^{-2}
 [C] $\left(\frac{1}{4}\right)^{-2}$

7. True or False? If the equation is false, then correct it to make it true.

- a) $2^3 = 2 \cdot 3$ **F** $2^3 = 2 \cdot 2 \cdot 2 = 8$
- b) $\frac{6x^7y^5}{3x^{-1}} = 2x^8y^5$ **TRUE**
- c) $xy^2z^{-3} \cdot x^6yz^4 = x^6y^2z$ **F** x^7y^3z
- d) $2x^2 \cdot (2x)^4 = 32x^6$ **TRUE**
- e) $6x^2 + (3x)^2 = 9x^4$ **F** $6x^2 + 9x^2 = 15x^2$
- f) $(2x^{-5}z^4)^3 = \frac{2z^{12}}{x^{15}}$ **F** $\frac{8z^{12}}{x^{15}}$

8. Mr. Nguyen gave his class a problem and asked them to find a number that could replace the question mark.

The problem was $(x^3)^0 = x^? \cdot x^5$.

Jobi says that the question mark should be replaced by 0.

Tiana says that the question mark should be 1.

Katiana says that the question mark should be -5.

Toby says that the question is impossible to answer.

Who is correct? Explain why.

Katiana $(x^3)^0 = x^0 = 1$
 $x^{-5} \cdot x^5 = x^0 = 1$

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9. Determine the number value that could appropriately replace the question mark to make the equation true.

a) $d^? \cdot d^4 = d^8$

4

b) $(x^2)^? = x^{-6}$

-3

c) $\frac{w^?}{w^3} = w^{-3}$

0

Change to a "d" $(?)^4 = 4^0$

"?" can be any real number except 0.

- #10 - 1: For the following problems, state what each student did incorrectly and fix their mistake.

10. Sarah's work

Line 1 $\frac{(p^4 d^{-3} q^5)^2}{q^{-1} (p^{-2} d^3)^{-2}}$

Line 2 $\frac{p^8 d^{-6} q^{10}}{q^2 p^4 d^{-3}}$

Line 3 $\frac{p^4 q^8}{d^3}$

q^{-1} is not included in the parenthesis for power of a product. d^3 is included in the parenthesis for power of a product.

$$\frac{p^8 d^{-6} q^{10}}{q^{-1} p^4 d^{-6}}$$

$$p^4 q^{11}$$

11. Tyrell's work

Line 1 $(2n^{-3})^{-4} \cdot 2n^{-3}$

Line 2 $(-8n^{12}) \cdot 2n^{-3}$

Line 3 $-16n^9$

$$2^{-4} \cdot 2^{-3} = 2^{-7}$$

$$\frac{1}{2^7} = \frac{1}{128}$$

$$\frac{n^9}{8}$$

12. A friend of yours is having a difficult time understanding why the answer to the following problem is true.

Explain how to simplify the expression to your friend. $\frac{3x^5(xy^3)^{-2}}{18x^{-4}y^5} = \frac{x^7}{6y^{11}}$

- 1) Do Power of a Product first $\rightarrow \frac{3x^5 x^{-2} y^{-6}}{18x^{-4} y^5}$
- 2) Apply Product of Powers law on numerator $\rightarrow \frac{3x^3 y^{-6}}{18x^{-4} y^5}$
- 3) Reduce the fraction $\frac{3}{18} = \frac{1}{6} \rightarrow \frac{x^3 y^{-6}}{6x^{-4} y^5}$
- 4) Apply quotient of Powers law on like bases $\rightarrow \frac{x^7 y^{-11}}{6}$
- 5) Apply negative exponent law $\rightarrow \frac{x^7}{6y^{11}}$

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13. Can you add the following expressions? Explain why or why not and state the answer.

$$-2x^3y^4 + 7x^3y^4 = 5x^3y^4$$

yes because they are like terms
so you just add the coefficients.

#14 – 22: Simplify. Your answer should contain only positive exponents.

14. $b^{-2} \cdot (2b)^2$
 $b^{-2} 4b^2$
 $4b^0$
 $4(1)$
 4

15. $\frac{(k^2)^{-2}}{2k^0k}$
 $\frac{k^{-4}}{2(1)k}$
 $\frac{1}{2k^5}$

16. $\frac{2p^{-3} \cdot p^2}{2p^0(2p)^4}$
 $\frac{2p^{-1}}{2 \cdot 1 \cdot 16p^4}$
 $\frac{2}{32p^5}$
 $\frac{1}{16p^5}$

17. $\left(\frac{c^3r^{-2}p^4}{r^2p^3}\right)^3$
 $\frac{c^9r^{-6}p^{12}}{r^6p^9}$
 $c^9r^{-12}p^3$
 $\frac{c^9p^3}{r^{12}}$

18. $(3(z^2b)^3)^2$
 $(3z^6b^3)^2$
 $9z^{12}b^6$

19. $2\left(\frac{3x^2}{2}\right)^2$
 $2\left(\frac{9x^4}{4}\right)$
 $\frac{9x^4}{2}$

Section 7.2A

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