Exponents

Practice

Exponent Properties

Exponential Property Summary

Multiplying and Dividing Monomials

Exponent Properties

Problem #1: Simplify the expression.
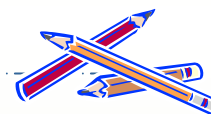
$$a^6 \cdot a^6 \cdot a^2$$

A. a^{14} B. a^{36} C. a^{72} D. $\dfrac{1}{a^{14}}$

Problem #2: Simplify the expression.

$$(-3p^2)^5$$

A. $-3p^{10}$ B. $-3p^7$ C. $-243p^{10}$ D. $-243p^7$

Exponent Properties

Problem #3: Simplify the expression.

$$(st)^4$$

A. st^4 B. $4st$ C. s^4t D. s^4t^4

Problem #4: Simplify the expression.

$$\left(\frac{2x^3}{3}\right)^3$$

A. $\dfrac{2x^9}{3}$ B. $\dfrac{8x^9}{27}$ C. $\dfrac{8x^6}{27}$ D. $\dfrac{2x^6}{3}$

Exponent Properties

Problem #5: Simplify the expression.

$$\frac{w^8}{w^2}$$

A. w^4 B. $\dfrac{1}{w^6}$ C. w^{10} D. w^6

Problem #6: Simplify the expression.

$$(5g^{-3})(4g^{-4})$$

A. $\dfrac{20}{g^7}$ B. $\dfrac{20}{g^{12}}$ C. $20g^7$ D. $20g^{12}$

Exponential Property Summary

Product of Powers

Problem #7: Simplify the expression.

$$a^4 \cdot a^5$$

A. a^9 B. a^{20}

Hint: $a^m \cdot a^n = a^{m+n}$

Quotient of Powers

Problem #8: Simplify the expression.

$$\frac{a^{12}}{a^7}$$

A. a^{-5} B. a^5

Hint : $\dfrac{a^m}{a^n} = a^{m-n}$

Power of a Power

Problem #9: Simplify the expression.

$$(a^2)^6$$

A. a^8 B. a^{12}

Hint : $(a^m)^n = a^{m \times n}$

Powers of a Product

Problem #10: Simplify the expression.

$$(ab)^8$$

A. $a^8 b^8$ B. ab^8

Hint: $(ab)^n = a^n b^n$

Power of a Fraction

Problem #11: Simplify the expression.

$$\left(\frac{a}{b}\right)^3$$

A. $a^3 b^3$ B. $\dfrac{a^3}{b^3}$

Hint: $\left(\dfrac{a}{b}\right)^n = \dfrac{a^n}{b^n}$

Negative Exponents

Problem #12: Simplify the expression.

$$a^{-9}$$

A. $\dfrac{1}{a^9}$ B. $\dfrac{1}{a^{-9}}$

Hint: $a^{-m} = \dfrac{1}{a^m}$ *or* $\dfrac{1}{a^{-m}} = a^m$

Zero Exponent

Problem #13: Simplify the expression.

$$6^0$$

A. 0 B. 1

Hint: $a^0 = 1$

Multiplying and Dividing Monomials

Problem #14: Simplify the expression.

$$(3a^4)(2a^5)$$

A. $5a^9$ B. $6a^9$ C. $5a^{20}$ D. $6a^{20}$

Hint for Problem #14:
Arrange the terms so that the numbers are together and the bases of a are together.

$$(3 \cdot 2)(a^4 \cdot a^5)$$

Problem #15: Simplify the expression.

$$\frac{x^3 y^5}{xy^3}$$

A. $x^2 y^2$ B. $x^3 y^2$ C. $x^4 y^8$ D. xy

Hint for Problem #15: Use the properties of exponents to simplify.

$$\frac{x^3 y^5}{xy^3} = x^{3-1} y^{5-3}$$

Multiplying and Dividing Monomials

Problem #16: Simplify the expression.

$$\frac{w^3}{w^{12}}$$

A. w^4 B. $\dfrac{1}{w^9}$ C. w^9 D. w^{15}

Problem #17: Simplify the expression.

$$\frac{5a^4b^2}{10a^3b^5}$$

A. $\dfrac{a^7}{2b^7}$ B. $\dfrac{2b^3}{a}$ C. $\dfrac{a^3}{2b}$ D. $\dfrac{a}{2b^3}$

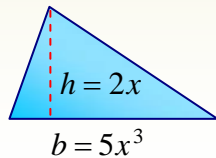# Multiplying and Dividing Monomials

Problem #18: State the letter of the expression that represents the area of the figure given below. $A = \dfrac{1}{2}bh$

$h = 2x$

$b = 5x^3$

A. $10x^4$ B. $10x^3$ C. $5x^4$ D. $5x^3$

Hint for Problem #18:
Step 1: Substitute the base *(b)* and height *(h)* into the formula for calculating area of a triangle.

$$A = \frac{1}{2}5x^3 \cdot 2x$$

Step 2: Arrange the terms so that the numbers are together and the bases of x are together.

Step 3: Use the properties of exponents to simplify.

Problem #19: State the letter of the expression that represents the volume of the figure given below. $V = lwh$

$h = x^2$

$w = 2x$

$l = 4x^2$
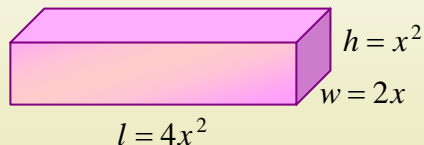
A. $8x^4$ B. $6x^4$ C. $6x^5$ D. $8x^5$

Hint for Problem #19:
Step 1: Substitute the length *(l)*, width *(w)*, and height *(h)* into the formula for calculating the area of a prism.

$$A = 4x^2 \cdot 2x \cdot x^2$$

Step 2: Arrange the terms so that the numbers are together and the bases of x are together.
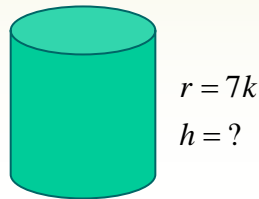
Step 3: Use the properties of exponents to simplify.

Multiplying and Dividing Monomials

Problem #20: Write an expression to represent the height of the cylinder given below. $V = \pi r^2 h$

$r = 7k$

$h = ?$

$V = 49k^{10}\pi$

A. $7k$ B. $49k^2$ C. k^8 D. $k^{10}\pi$

Hint for Problem #20:
Step 1: Substitute "$7k$" in for the radius *(r)* into the formula for calculating volume of a cylinder and simplify.

$$V = \pi \cdot (7k)^2 \cdot h$$

Step 2: Substitute $49k^{10}\pi$ in for "*V*" in the equation above.

$$49k^{10}\pi = \pi \cdot (7k)^2 \cdot h$$

Step 3: Solve for "*h*".

Step 4: Use the properties of exponents to simplify.

Problem #21: Which expression is equal to the given expression?

$$\frac{(2x)(7y)}{6}$$

A. $\dfrac{56}{24xy}$ B. $\dfrac{56x^3y^4}{24x^2y^3}$ C. $\dfrac{14x^2y^3}{6x^3y^4}$ D. $\dfrac{42x^3y^4}{18x^2y^2}$

Hint for Problem #21:
Step 1: Simplify the given expression.

Step 2: Simplify all the choices to determine which one is equivalent to the given expression..

Answers

Problem #1: Choice "A".

Problem #2: Choice "C".

Problem #3: Choice "D".

Problem #4: Choice "B".

Problem #5: Choice "D".

Problem #6: Choice "A".

Problem #7: Choice "A".

Problem #8: Choice "B".

Problem #9: Choice "B".

Problem #10: Choice "A".

Problem #11: Choice "B".

Problem #12: Choice "A".

Problem #13: Choice "B".

Problem #14: Choice "B".

Problem #15: Choice "A".

Problem #16: Choice "B".

Problem #17: Choice "D".

Problem #18: Choice " C".

Problem #19: Choice "D".

Problem #20: Choice "C".

Problem #21: Choice "B".