

Name:

Date: Score:

Exponent Rules Worksheet

1 Product Rule: $a^m \times a^n = a^{m+n}$

$$2^3 \times 2^2 = 2^{3+2}$$
$$= 2^5$$

2 Quotient Rule: $\frac{a^m}{a^n} = a^{m-n}$

$$\frac{2^3}{2^2} = 2^{3-2}$$
$$= 2^1$$

3 Zero Exponent Rule: $a^0 = 1$

$$2^0 = 1$$

4 Power Rule: $(a^m)^n = a^{m \times n} = a^{mn}$

$$(2^3)^2 = 2^{3 \times 2} = 2^6$$

5 Negative Exponents Rule: $a^{-m} = \frac{1}{a^m}$

$$2^{-3} = \frac{1}{2^3}$$

$$\frac{1}{a^{-m}} = a^m$$

$$\frac{1}{2^{-3}} = 2^3$$

6 Expanded Power Rule: $(ab)^m = a^m \times b^m$

$$(2 \times 5)^3 = 2^3 \times 5^3$$

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

$$\left(\frac{2}{5}\right)^3 = \frac{2^3}{5^3}$$

Simplify using appropriate exponent rule

1 $(2a^2b)(4ab^2)$

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

3 $\frac{18x^3}{-3x^2}$

4 $(a^2)^6$

5 $12a^0$

6 $(-4)^4$

7 $(3ab^{12})^3$

8 $6a^5 \cdot 3a^5 \cdot a^0$

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⑤ Negative Exponents Rule: $a^{-m} = \frac{1}{a^m}$

$$2^{-3} = \frac{1}{2^3}$$

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⑥ Expanded Power Rule: $(ab)^m = a^m \times b^m$

$$(2 \times 5)^3 = 2^3 \times 5^3$$

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

$$\left(\frac{2}{5}\right)^3 = \frac{2^3}{5^3}$$

Answers

① $(2a^2b)(4ab^2)$

$$8a^3b^3$$

② $(5a^2b^4)^3$

$$125a^6b^{12}$$

③ $\frac{18x^3}{-3x^2}$

$$-6x$$

④ $(a^2)^6$

$$a^{12}$$

⑤ $12a^0$

$$12$$

⑥ $(-4)^4$

$$256$$

⑦ $(3ab^{12})^3$

$$27a^3b^{36}$$

⑧ $6a^5 \cdot 3a^5 \cdot a^0$

$$18a^6b^5$$