

Intermediate Algebra

5-1

Laws of Exponents

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1) $\frac{x^9}{x^5} = \underline{x^4}$

2) $x^1 = \underline{x}$

3) $(x^3)^5 = \underline{x^{15}}$

4) $\frac{x^2}{x^7} = \underline{\frac{1}{x^5} (x^{-5})}$

5) $x^5 \cdot x^2 = \underline{x^7}$

6) $x^0 = \underline{1}$ Anything to the zero power = 1 except $0^0 = \emptyset$

7) $x^{-1} = \underline{\frac{1}{x}}$

8) $3^{-2} = \underline{\frac{1}{9}}$

1) When multiplying, add the powers.

2) When dividing, subtract the powers.

3) When the power is outside the parentheses, multiply the powers.

4) A negative power means reciprocal
(one over)

Simplify.

2) $(-2ab^4)(-3a^2b^4)$
 $\underline{6a^3b^8}$

8) $(2^2a^2b^3)^3$
 $\underline{64a^6b^9}$

10) $(xy)(x^2y)^5$
 $\underline{x^9y^5}$

Simplify.

18) $(3x^4y^3)^2$

$$\boxed{9x^8y^6}$$
$$\boxed{= 81x^8y^{12}}$$

22) $y^{2n} \cdot y^{4n+1}$

$$y^{2n+4n+1}$$
$$\boxed{= y^{6n+1}}$$

36) $(4ab)^2(-2ab^2c^3)^3$

$$(16a^2b^2)(-8a^3b^6c^9)$$
$$\boxed{= -128a^5b^8c^9}$$

Simplify.

42) $\frac{2x^2}{y^4} = \frac{2}{x^2y^4}$

54) $\frac{x^2y^{-11}}{xy^2} = \frac{y^2}{x^2 \cdot x \cdot y^9}$

$$= \frac{y^2}{x^3y^9}$$
$$= \frac{1}{x^3y^7}$$

Assignment:
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