

Name: .....

Date: ..... Score: .....

## Exponents Worksheet

Solve each exponent

1  $\left(\frac{1}{2}a^2b^3\right)^3$

2  $\left(\frac{1}{2}\right)^5 \cdot \left(\frac{1}{2}\right)^8$

3  $(2^{-8} \div 2^{-12}) \times 2^{-6}$

4  $\left\{\left(-\frac{1}{3}\right)^3 \div \left(\frac{1}{3}\right)^2\right\}^3$

5  $\frac{a^{25}}{a^{25} \cdot a^{10}}$

6  $\frac{15a^{-8}}{a^6}$

7  $\left\{\left(\frac{1}{2}\right)^{-2} - \left(\frac{1}{3}\right)^{-3}\right\} \div \left(\frac{1}{5}\right)^{-2}$

8  $2x^{-3} \cdot 8x^3$

9 Solve for  $x$

a  $49^{8x-9} = 7^{8-x}$

b  $(81)^{-5} \div (729)^{3-x} = (9)^{5x}$

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### Answers

$$\boxed{1} \quad \left(\frac{1}{2}a^2b^3\right)^3$$

$$\frac{a^6b^9}{8}$$

$$\boxed{2} \quad \left(\frac{1}{2}\right)^5 \cdot \left(\frac{1}{2}\right)^8$$

$$\frac{1}{8192}$$

$$\boxed{3} \quad (2^{-8} \div 2^{-12}) \times 2^{-6}$$

$$\frac{1}{4}$$

$$\boxed{4} \quad \left\{ \left(-\frac{1}{3}\right)^3 \div \left(\frac{1}{3}\right)^2 \right\}^3$$

$$-\frac{1}{27}$$

$$\boxed{5} \quad \frac{a^{25}}{a^{25} \cdot a^{10}}$$

$$a^{-10}$$

$$\boxed{6} \quad \frac{15a^{-8}}{a^6}$$

$$15a^{-14}$$

$$\boxed{7} \quad \left\{ \left(\frac{1}{2}\right)^{-2} - \left(\frac{1}{3}\right)^{-3} \right\} \div \left(\frac{1}{5}\right)^{-2}$$

$$-\frac{23}{25}$$

$$\boxed{8} \quad 2x^{-3} \cdot 8x^3$$

$$24$$

$\boxed{9}$

$$\boxed{a} \quad 49^{8x-9} = 7^{8-x}$$

$$\frac{26}{17}$$

$$\boxed{b} \quad (81)^{-5} \div (729)^{3-x} = (9)^{5x}$$

$$x = -\frac{19}{2}$$