

HW: Worksheet/all problems

**Warm up:**

Simplify.

1)  $x^6 \cdot x^8$

$x^{14}$

2)  $b^7 \cdot b^7$

$b^{14}$

3)  $y^r \cdot y^w$

$y^{r+w}$

4)  $c^{2x} \cdot c^{3x-5}$

$c^{5x-5}$

5)  $\frac{5^9}{5^3}$

$5^6$

6)  $\frac{x^{15}}{x^7}$

$x^8$

$2x + 3x - 5$

$$(x^3)^4 = x^{12}$$

$$\left( (x^3)^4 \right)^5 = x^{60}$$

$$\frac{3^5}{3^5} = \frac{\cancel{3} \cdot \cancel{3} \cdot \cancel{3} \cdot \cancel{3} \cdot \cancel{3}}{\cancel{3} \cdot \cancel{3} \cdot \cancel{3} \cdot \cancel{3} \cdot \cancel{3}} = 1$$

$$3^0 = 1$$

For any number  $x$ ...

$$8^0 = 1$$

$$5^0 = 1$$

$$x^0 = 1$$

$$\frac{x^5}{x} = \frac{\cancel{x} \cdot x \cdot x \cdot x \cdot x}{\cancel{x}} = \frac{x^4}{1} = x^4$$

$$\frac{3^{13}}{3^8} = \frac{\cancel{3} \cdot \cancel{3} \cdot \cancel{3} \cdot \cancel{3} \cdot \cancel{3} \cdot \cancel{3} \cdot \cancel{3} \cdot \cancel{3} \cdot \cancel{3} \cdot \cancel{3} \cdot \cancel{3} \cdot \cancel{3} \cdot 3 \cdot 3 \cdot 3}{\cancel{3} \cdot \cancel{3} \cdot \cancel{3} \cdot \cancel{3} \cdot \cancel{3} \cdot \cancel{3} \cdot \cancel{3} \cdot \cancel{3}}$$

$$\frac{3^5}{1} = 3^5$$

$$\frac{5^3}{5^5} = \frac{\cancel{5 \cdot 5 \cdot 5}}{\cancel{5 \cdot 5 \cdot 5} \cdot 5 \cdot 5} = \frac{1}{5^2} = 5^{-2}$$

$$\frac{x^4}{x^7} = \frac{\cancel{x \cdot x \cdot x \cdot x}}{\cancel{x \cdot x \cdot x} \cdot x \cdot x \cdot x} = \frac{1}{x^3} = x^{-3}$$

$$x^{-n} = \frac{1}{x^n}$$

$$3^{-3} = \frac{1}{3^3} = \frac{1}{27}$$

$$x^{-12} = \frac{1}{x^{12}}$$

$$5^{-2} = \frac{1}{5^2} = \frac{1}{25}$$

$$3^{-7} = \frac{1}{3^7} = \frac{1}{2187}$$

## HW Solutions

$$\textcircled{8} (4^2)^3 = 4^2 \cdot 4^2 \cdot 4^2 = 4^6$$

$$\textcircled{25} (2m^5 n^{11})^6 = \textcircled{6^4 | m^{30} n^{66}}$$

$$2^6 = 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 = 64$$

$$(m^5)^6 = m^{30}$$

$$(n^{11})^6 = n^{66}$$

②

$$(8v^9)^5$$

$$32768v^{45}$$

$$8^5 = 8 \cdot 8 \cdot 8 \cdot 8 \cdot 8 = 64 \cdot 8 \cdot 8 \cdot 8$$

$$\begin{array}{r} (v^9)^5 \\ 512 \\ \times \quad 8 \\ \hline 4096 \end{array}$$

$$\begin{array}{r} 304 \\ \times \quad 8 \\ \hline 512 \end{array}$$

$$\begin{array}{r} 512 \cdot 8 \cdot 8 \\ 4096 \cdot 8 \end{array}$$

$$\begin{array}{r} 4096 \\ \times \quad 8 \\ \hline 32768 \end{array}$$

$$Q2) \quad (11c^4)^3$$

$$11^3 = 11 \cdot 11 \cdot 11 = 121 \cdot 11$$

$$1331c^{12}$$

$$\begin{array}{r} 121 \\ \times 11 \\ \hline 121 \\ 1210 \\ \hline 1331 \end{array}$$

26

$$(-3w^3z^8)^5$$

$$(-3)^5 = (-3)(-3)(-3)(-3)(-3) = -243$$

$$(w^3)^5 = w^{15}$$

$$(z^8)^5 = z^{40}$$

$$-243w^{15}z^{40}$$

Q3

$$(-5r^4s^{12})^4$$

$$(-5)^4 = (-5)(-5)(-5)(-5) = 625$$

$$(r^4)^4 = r^{16}$$

$$(s^{12})^4 = s^{48}$$

$$625r^{16}s^{48}$$

$$\textcircled{29} \quad (6a^2b^4)^3$$

$$6 \cdot 6 \cdot 6 = 36 \cdot 6$$

$$\begin{array}{r} 36 \\ \times 6 \\ \hline 216 \end{array}$$

$$216a^6b^{18}$$

$$1) \frac{x^8}{x^3} \quad 2) \frac{r^t}{r^y} \quad 3) \frac{s^5}{s^7}$$

$$4) \frac{g^3}{g^{18}} \quad 5) \frac{k^{14}}{k^{19}} \quad 6) 2^{-3}$$

$$7) 6^{-2}$$

$$8) 3^{-4}$$

$$9) 8^{-1}$$