

**Exponents - Product Rule**

A) Use the product rule to rewrite each expression as a single exponent.

1) $(-5)^{-10} \cdot (-5)^{15}$

$(-5)^{\underline{\hspace{1cm}}}$

2) $\left(\frac{4}{5}\right)^{-6} \cdot \left(\frac{4}{5}\right)^{-9}$

$\left(\frac{4}{5}\right)^{\underline{\hspace{1cm}}}$

3) $(1.4)^{-12} \cdot (1.4)^5$

$(1.4)^{\underline{\hspace{1cm}}}$

4) $\left(-\frac{7}{6}\right)^9 \cdot \left(-\frac{7}{6}\right)^3$

$\left(-\frac{7}{6}\right)^{\underline{\hspace{1cm}}}$

5) $(-13)^0 \cdot (-13)^{-19}$

$(-13)^{\underline{\hspace{1cm}}}$

6) $8^{-14} \cdot 8^{-4}$

$(8)^{\underline{\hspace{1cm}}}$

B) Find the value of x .

1) $10^x \cdot 10^{-9} = 10^{11}$

$10^{\underline{\hspace{1cm}}} = 10^{\underline{\hspace{1cm}}}$
 $x - 9 = 11$
 $x = \underline{\hspace{1cm}}$

2) $\left(-\frac{8}{7}\right)^{-x} \cdot \left(-\frac{8}{7}\right)^{-15} = \left(-\frac{8}{7}\right)^{-10}$
 $\left(-\frac{8}{7}\right)^{-x-15} = \left(-\frac{8}{7}\right)^{-10}$
 $-x - 15 = -10$

$x = \underline{\hspace{1cm}}$

3) $(-2.9)^{-13} \cdot (-2.9)^x = (-2.9)^{-5}$
 $-13 + x = -5$
 $-2.9^{-13+x} = -2.9^{-5}$

$x = \underline{\hspace{1cm}}$

4) $x^7 \cdot (5.6)^7 = (5.6)^{14}$
 $(x)^7 = (5.6)^{14-7}$

$x = \underline{\hspace{1cm}}$

5) $(-20)^{16} \cdot (-20)^x = (-20)^{-3}$
 $(-20)^{16+x} = (-20)^{-3}$
 $16 + x = -3$

$x = \underline{\hspace{1cm}}$

6) $11^{-x} \cdot 11^6 = 11^{16}$
 $(11)^{6-x} = (11)^{16}$
 $6 - x = 16$

$x = \underline{\hspace{1cm}}$

C) 1) Which of the following equals $(-19)^{-12} \cdot (-19)^4$?

i) $(-19)^{-8}$

ii) $(-19)^8$

iii) $(-19)^{17}$

iv) $(-19)^{16}$

2) Find the value of x , if $(-4.5)^x \cdot (-4.5)^9 = (-4.5)^{11}$.

i) 20

ii) -5

iii) -3

iv) 2