

Name : _____

T2S1

Exponents - Product Rule

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

1) $k^{-1} \cdot k^6$

2) $(-4)^{11} \cdot (-4)^{-7}$

3) $\left(\frac{c}{d}\right)^9 \cdot \left(\frac{c}{d}\right)^0$

4) $a^{-3} \cdot a^{-5}$

5) $(0.5)^{-18} \cdot (0.5)^{15}$

6) $(-t)^{-12} \cdot (-t)^2$

B) Find the value of x .

1) $(-12)^{-1} \cdot (-12)^x = (-12)^{-16}$

$x =$ _____

2) $b^{-7} \cdot x^{28} = b^{21}$

$x =$ _____

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

$x =$ _____

4) $m^9 \cdot m^{-x} = m^{-19}$

$x =$ _____

5) $11^x \cdot 11^4 = 11^{-16}$

$x =$ _____

6) $(-2.3)^x \cdot (-2.3)^{-14} = (-2.3)^{17}$

$x =$ _____

C) 1) Which of the following equals $3^7 \cdot 3^{-13}$?

i) 3^{-6}

ii) 3^6

iii) -3^{-6}

iv) -3^{20}

2) Find the value of x , if $(-q)^5 \cdot (-q)^x = (-q)^{10}$.

i) 10

ii) 5

iii) -10

iv) 15

Name : _____

Exponents - Product Rule

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

1) $k^{-1} \cdot k^6$

 k^5

2) $(-4)^{11} \cdot (-4)^{-7}$

 $(-4)^4$

3) $\left(\frac{c}{d}\right)^9 \cdot \left(\frac{c}{d}\right)^0$

 $\left(\frac{c}{d}\right)^9$

4) $a^{-3} \cdot a^{-5}$

 a^{-8}

5) $(0.5)^{-18} \cdot (0.5)^{15}$

 $(0.5)^{-3}$

6) $(-t)^{-12} \cdot (-t)^2$

 $(-t)^{-10}$

B) Find the value of x .

1) $(-12)^{-1} \cdot (-12)^x = (-12)^{-16}$

$x =$ **-15**

2) $b^{-7} \cdot x^{28} = b^{21}$

$x =$ **b**

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

$x =$ **-25**

4) $m^9 \cdot m^{-x} = m^{-19}$

$x =$ **28**

5) $11^x \cdot 11^4 = 11^{-16}$

$x =$ **-20**

6) $(-2.3)^x \cdot (-2.3)^{-14} = (-2.3)^{17}$

$x =$ **31**

C) 1) Which of the following equals $3^7 \cdot 3^{-13}$?

i) 3^{-6}

ii) 3^6

iii) -3^{-6}

iv) -3^{20}

2) Find the value of x , if $(-q)^5 \cdot (-q)^x = (-q)^{10}$.

i) 10

ii) 5

iii) -10

iv) 15

Name : _____

T2S2

Exponents - Product Rule

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

1) $(-1.6)^{-13} \cdot (-1.6)^{-16}$

2) $\left(\frac{1}{q}\right)^{-15} \cdot \left(\frac{1}{q}\right)^9$

3) $n^6 \cdot n^{-2}$

4) $13^{-11} \cdot 13^4$

5) $(-c)^{10} \cdot (-c)^{17}$

6) $9^7 \cdot 9^{12}$

B) Find the value of x .

1) $\left(\frac{v}{w}\right)^x \cdot \left(\frac{v}{w}\right)^8 = \left(\frac{v}{w}\right)^{-6}$

$x =$ _____

2) $(5.1)^{20} \cdot (5.1)^{-x} = (5.1)^{14}$

$x =$ _____

3) $u^x \cdot u^{-7} = u^{15}$

$x =$ _____

4) $17^{-x} \cdot 17^4 = 17^{-19}$

$x =$ _____

5) $(-p)^0 \cdot (-p)^{-x} = (-p)^{17}$

$x =$ _____

6) $x^8 \cdot (-6)^{12} = (-6)^{20}$

$x =$ _____

C) 1) Find the value of x , if $\left(-\frac{t}{5}\right)^x \cdot \left(-\frac{t}{5}\right)^{-5} = \left(-\frac{t}{5}\right)^{-10}$.

i) 15

ii) -15

iii) -5

iv) 5

2) Which of the following equals $z^8 \cdot z$?

i) z^8

ii) z^7

iii) $(-z)^9$

iv) z^9

Name : _____

Exponents - Product Rule

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

1) $(-1.6)^{-13} \cdot (-1.6)^{-16}$

$(-1.6)^{-29}$

2) $\left(\frac{1}{q}\right)^{-15} \cdot \left(\frac{1}{q}\right)^9$

$\left(\frac{1}{q}\right)^{-6}$

3) $n^6 \cdot n^{-2}$

n^4

4) $13^{-11} \cdot 13^4$

13^{-7}

5) $(-c)^{10} \cdot (-c)^{17}$

$(-c)^{27}$

6) $9^7 \cdot 9^{12}$

9^{19}

B) Find the value of x .

1) $\left(\frac{v}{w}\right)^x \cdot \left(\frac{v}{w}\right)^8 = \left(\frac{v}{w}\right)^{-6}$

$x =$ -14

2) $(5.1)^{20} \cdot (5.1)^{-x} = (5.1)^{14}$

$x =$ 6

3) $u^x \cdot u^{-7} = u^{15}$

$x =$ 22

4) $17^{-x} \cdot 17^4 = 17^{-19}$

$x =$ 23

5) $(-p)^0 \cdot (-p)^{-x} = (-p)^{17}$

$x =$ -17

6) $x^8 \cdot (-6)^{12} = (-6)^{20}$

$x =$ -6

C) 1) Find the value of x , if $\left(-\frac{t}{5}\right)^x \cdot \left(-\frac{t}{5}\right)^{-5} = \left(-\frac{t}{5}\right)^{-10}$.

i) 15

ii) -15

iii) -5

iv) 5

2) Which of the following equals $z^8 \cdot z$?

i) z^8

ii) z^7

iii) $(-z)^9$

iv) z^9

Name : _____

T2S3

Exponents - Product Rule

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

1) $(-w)^{-14} \cdot (-w)^4$

2) $r^{-6} \cdot r^{-2}$

3) $2^{12} \cdot 2^{-15}$

4) $(7.7)^{18} \cdot (7.7)^{-5}$

5) $\left(-\frac{u}{3}\right)^9 \cdot \left(-\frac{u}{3}\right)^3$

6) $(-d)^{-10} \cdot (-d)^{19}$

B) Find the value of x .

1) $q^{-x} \cdot q^{11} = q^{-14}$

$x =$ _____

2) $3^{18} \cdot 3^{-x} = 3^2$

$x =$ _____

3) $(-m)^x \cdot (-m)^{-10} = (-m)^{-21}$

$x =$ _____

4) $(-x)^{29} \cdot \left(-\frac{y}{z}\right)^{-9} = \left(-\frac{y}{z}\right)^{20}$

$x =$ _____

5) $(3.2)^x \cdot (3.2)^{-5} = (3.2)^{-15}$

$x =$ _____

6) $s^4 \cdot s^{-x} = s^6$

$x =$ _____

C) 1) Which of the following equals $(-k)^{-2} \cdot (-k)^3$?

i) $(-k)^5$

ii) $(-k)^{-6}$

iii) k

iv) $-k$

2) Find the value of x , if $(4.9)^{-19} \cdot (4.9)^x = (4.9)^0$.

i) 19

ii) -19

iii) 0

iv) 38

Name : _____

Exponents - Product Rule

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

1) $(-w)^{-14} \cdot (-w)^4$

2) $r^{-6} \cdot r^{-2}$

3) $2^{12} \cdot 2^{-15}$

$(-w)^{-10}$

r^{-8}

2^{-3}

4) $(7.7)^{18} \cdot (7.7)^{-5}$

5) $\left(-\frac{u}{3}\right)^9 \cdot \left(-\frac{u}{3}\right)^3$

6) $(-d)^{-10} \cdot (-d)^{19}$

$(7.7)^{13}$

$\left(-\frac{u}{3}\right)^{12}$

$(-d)^9$

B) Find the value of x .

1) $q^{-x} \cdot q^{11} = q^{-14}$

2) $3^{18} \cdot 3^{-x} = 3^2$

3) $(-m)^x \cdot (-m)^{-10} = (-m)^{-21}$

$x =$ 25

$x =$ 16

$x =$ -11

4) $(-x)^{29} \cdot \left(-\frac{y}{z}\right)^{-9} = \left(-\frac{y}{z}\right)^{20}$

5) $(3.2)^x \cdot (3.2)^{-5} = (3.2)^{-15}$

6) $s^4 \cdot s^{-x} = s^6$

$x =$ $\frac{y}{z}$

$x =$ -10

$x =$ -2

C) 1) Which of the following equals $(-k)^{-2} \cdot (-k)^3$?

i) $(-k)^5$

ii) $(-k)^{-6}$

iii) k

iv) $-k$

2) Find the value of x , if $(4.9)^{-19} \cdot (4.9)^x = (4.9)^0$.

i) 19

ii) -19

iii) 0

iv) 38