

MyCalcWorld – Exponent Rules #1



$$x^a \cdot x^b = x^{a+b}$$



Making This Rule Make Sense:

Consider: $x^3 \cdot x^5 = (x \cdot x \cdot x) \cdot (x \cdot x \cdot x \cdot x \cdot x) = x^{3+5} = x^8$

Remember that $x^5 = x \cdot x \cdot x \cdot x \cdot x$
Remember that $x^3 = x \cdot x \cdot x$ } There are 8 total x's.

Consider: $x^a \cdot x^b = (\text{write } x 'a' \text{ times}) \cdot (\text{write } x 'b' \text{ times}) = x^{a+b} = \text{the rule}$

Remember that $x^a = x_1 \cdot x_2 \cdot x_3 \cdots x_a$
Remember that $x^b = x_1 \cdot x_2 \cdot x_3 \cdots x_b$ } There are (a+b) total x's.

Example #1: $x^6 \cdot x^7 = (x \cdot x \cdot x \cdot x \cdot x \cdot x) \cdot (x \cdot x \cdot x \cdot x \cdot x \cdot x \cdot x) = x^{6+7} = x^{13}$

Example #2: $\sin^3 x \cdot \sin^5 x \cdot \sin x = \sin^9 x$

Example #3: $(3x + 4)^{19}(3x + 4)^9 = (3x + 4)^{28}$

Example #4: $(xy^5z^7)^4(xy^5z^7)^2 = (xy^5z^7)^6$

Example #5: $3x^5 \cdot 6x^{12} = 18x^{17}$

Time to practice... Factor the following on your own:

1. $x^6 \cdot x^3 =$

5. $\tan^4 x \cdot \tan^2 x \cdot \tan^3 x =$

2. $7x^8 \cdot 4x^{13} \cdot 2x^4 =$

6. $(x^2 - 3x + 1)^2(x^2 - 3x + 1)^4 =$

3. $(e^x - 1)^5(e^x - 1)^2 =$

7. $(\sin 5x)^3(\sin 5x)^7 =$

4. $\ln^4 2x \cdot \ln^9 2x =$

8. $\frac{2}{3}x \cdot 6x^7 \cdot 7x^9 =$



$$x^a \cdot x^b = x^{a+b}$$



ANSWER KEY

1. x^9

2. $56x^{25}$

3. $(e^x - 1)^7$

4. $(\ln 2x)^{13}$ or $\ln^{13}(2x)$

5. $(\tan x)^9$ or $\tan^9 x$

6. $(x^2 - 3x + 1)^6$

7. $(\sin 5x)^{10}$ or $\sin^{10}(5x)$

8. $28x^{17}$