Due the 1st day of School! You MUST SHOW WORK to receive credit, NO WORK, NO CREDIT! Answers on this page, work on a separate sheet.

**Part I: Laws of Exponents**



Simplify the expression using the laws of exponents. There should be no negative exponents when completely simplified.

1. $x^{5}∙x^{2}$ 2. $y^{3}∙y∙y^{4}$ 3. $2b^{4}∙3b^{-4}$
2. $a^{10}∙a^{2}∙a^{-6}$ 5. $\frac{x^{5}}{x^{2}}$ 6. $\frac{c^{4}}{c^{8}}$

7. $\frac{5x^{4}}{x^{9}}$ 8. $\frac{2c^{5}}{4c^{3}}$ 9. $\frac{b^{3}∙b^{4}}{b^{2}}$

10. $\left(z^{5}\right)^{5}$ 11. $\left(a^{7}\right)^{2}$ 12. $\left(m^{-3}\right)^{-8}$

Distributive Property of Exponents:

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| --- | --- |
| Property | Example |
| $$\left(xy\right)^{a}=x^{a}y^{a}$$ | $$\left(x^{2}y^{3}\right)^{2}=\left(x^{2}\right)^{2}\left(y^{3}\right)^{2}$$ $=x^{2∙2}y^{3∙2}$ $=x^{4}y^{6}$ |
| $$\left(\frac{x}{y}\right)^{a}=\frac{x^{a}}{y^{a}}$$ | $\left(\frac{x^{2a}}{y^{3b}}\right)^{3}=\frac{\left(x^{2a}\right)^{3}}{\left(y^{3b}\right)^{3}} $  $ =\frac{x^{2a∙3}}{y^{3b∙3}} $ $=\frac{x^{6a}}{y^{9b}} $ |

13. $\left(3x^{2}\right)^{4}$ 14. $\left(2ab\right)^{5}$ 15. $\left(x^{2}y^{4}m^{3}\right)^{8}$

16. $\left(2x^{3}y^{6}\right)^{6}$ 17. $p^{2}∙\left(p^{5}\right)^{2}$ 18. $\left(m^{7}\right)^{4}∙m^{3}$

19. $\left(\frac{a^{2}}{b^{3}}\right)^{4}$ 20. $\left(\frac{2m^{3}}{3}\right)^{3}$ 21. $\left(\frac{3x^{3}}{4y^{4}}\right)^{2}$

Putting it all together:

23. 24. 25.

**Part II: Factor out the Greatest Common Factor**



Factor out the GCF:

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**Part III: Factor by Grouping**

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Factor the following by grouping:

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**Part III: Factor a Trinomial (YOU MUST SHOW WORK!)**

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**Part IV: Factor a Difference of Squares**

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