

Name:

Date:

Period:

Multiplying Monomials:

- 1: WRITE OUT the expanded problem (if applicable)!
- 2: Multiply numerical coefficients.
- 3: KEEP the base(s) and ADD exponents of variables of same base(s)
(example of powers of the same base: $2^3 \bullet 2^2$, $b^3 \bullet b^4$, $3x^2 \bullet 4x^2$)

Examples:

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|----|---------------|--|---------------------------|----|---|---|---------------------------|
| 1. | $(7x)(5x)$ | 1: Step 1 N/A
2: Mult coefficients $\rightarrow 35$
3: Add exp same base $\rightarrow x^2$ | Ans:
$35x^2$ | 2. | $3x^3 \bullet (-9x)$ | 1: Step 1 N/A
2: Mult coefficients $\rightarrow -27$
3: Add exp same base $\rightarrow x^4$ | Ans:
$-27x^4$ |
| 3. | $(-3c^2)^3$ | 1: $(-3c^2)(-3c^2)(-3c^2)$
2: Mult coefficients $\rightarrow -27$
3: Add exp same base $\rightarrow c^6$ | Ans:
$-27c^6$ | 4. | $(3xy^2)(5x^3y^4)$ | 1: Step 1 N/A
2: Mult coefficients $\rightarrow 15$
3: Add exp same base $\rightarrow x^4y^6$ | Ans:
$15x^4y^6$ |
| 5. | $(-a^3b^2)^3$ | 1: $(-a^3b^2)(-a^3b^2)(-a^3b^2)$
2: Mult coefficients $\rightarrow -1$
3: Add exp same base $\rightarrow a^9b^6$ | Ans:
$-1a^9b^6$ | 6. | $m^4 \bullet n^3 \bullet m \bullet n^4$ | 1: Step 1 N/A
2: Mult coefficients $\rightarrow 1$
3: Add exp same base $\rightarrow m^5n^7$ | Ans:
m^5n^7 |

Your Turn:

- | | | | | | | | |
|-----|-------------------|-----|---------------------|-----|---|-----|-----------------------------|
| 1. | $x^2 \bullet x^3$ | 2. | $c^5 \bullet c^5$ | 3. | $c^3 \bullet c$ | 4. | $a^7 \bullet a^4 \bullet a$ |
| 5. | $a^6 \bullet b^3$ | 6. | $(a)(a)$ | 7. | $(5y)^3$ | 8. | $(a^4)^3$ |
| 9. | $a^5 \bullet a^8$ | 10. | $(-x^2)^3$ | 11. | $(2y^3)^4$ | 12. | $5^2 \bullet 5^4$ |
| 13. | $3^2 \bullet 2^3$ | 14. | $10^4 \bullet 10^2$ | 15. | $x^4 \bullet x^2 \bullet y^5 \bullet y$ | 16. | $(y^2)^3$ |
| 17. | $(6x^{10})^2$ | 18. | $(-a^3b^4)^3$ | 19. | $(5x^2)(6x^3)$ | 20. | $(3x)(7x)$ |
| 21. | $(-2a^2b)(5a^4c)$ | 22. | $(-6y^3)(2y)$ | 23. | $(3a)(a)$ | 24. | $(-3a^2b^3)(-4a^4b)$ |
| 25. | $(3x)^2$ | 26. | $(-3x^2)^3$ | 27. | $8xy(-5yz)$ | 28. | $(-5x)^2$ |
| 29. | $(5y)(y^2)$ | 30. | $3x^2(-6x^4)$ | | | | |
31. A rectangle has a length of $6x$ and a width of $5x$.
- a) Find the area in terms of x . b) If $x = 3$ inches, what is the area in square inches?
32. Find the area of a square whose side measures $3x$, if $x = 7$.
33. Consider this:
Can you figure out how to get the SAME base so we can add exponents?
 $(32)(4)^2$

Dividing Monomials:

- 1: If you start with a fraction, you end with a fraction.
- 2: Divide numerical coefficients (it might mean just reducing your fraction).
- 3: Cancel out variables of the same base and determine whether you have more on the top or bottom.
Leave your answer there.
(you are subtracting the exponents of variables of same base but don't leave negative exponents).

Examples:

<p>1. Long-hand this means:</p> $\frac{x^5 y^3}{x^2 y^4} \longrightarrow \frac{\text{xxxxx } yyy}{xx \text{ yyyy}}$ <p style="text-align: center;">Cancel what you can</p> $\frac{\cancel{\text{xxxxx}} \text{ yyy}}{\cancel{xx} \text{ yyy}}$ <p style="text-align: center;">Your answer is what is left:</p> $\frac{x^3}{y}$ <p style="text-align: center;">3 x's are left on the top and 1 y is left on the bottom</p>	<p>2. Long-hand this means:</p> $\frac{27a b^2 c^3}{9a^4 b^4 c} \longrightarrow \frac{27a \text{ bb } ccc}{9 \text{ aaaa } bbbb \text{ c}}$ <p style="text-align: center;">Divide coefficients and cancel what you can</p> $\frac{3a \text{ bb } ccc}{1 \text{ aaaa } bbbb \text{ c}}$ $\frac{3c^2}{1 a^3 b^2}$
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Without writing it ALL out. Just picture where there are more variables and by how many.

<p>3. $\frac{14ab^2c^3}{35ab^4c}$</p> $\frac{2c^2}{5b^2}$	<p>4. $\frac{-12p^5q^2}{24p^8q^6}$</p> $\frac{-1}{2p^3q^4}$
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Your Turn...

1. $\frac{24a^5}{3a^2}$	2. $\frac{-18x^3y^2}{6x^2y}$	3. $\frac{c^{15}}{c^8}$
4. $\frac{3^{-6}}{3^{-2}}$	5. $\frac{5k^3}{5k}$	6. $\frac{12a^2b^3}{6a^2b}$
7. $\frac{-14ab^2c}{21a^2bc^2}$	8. $\frac{c^3d^2}{c^8d^4}$	9. $\frac{-13p^4q^3}{26p^5q^7}$
10. $\frac{12a^4m^3}{16a^3m^8}$	11. $\frac{80p^2t^2}{4p^2t^4}$	12. $\frac{4p^2q^3}{12pq}$
13. $\frac{5a^4c^2}{15a^3c^6}$	14. $\frac{12x^3y^2}{18x^4y^3}$	15. $\frac{3n^3z^2}{4n^3z^3}$
16. $\frac{x^4y^7}{x^3y^3}$	17. $\frac{9a^2b^4}{18a^3b^5}$	18. $\frac{6q^3v^3}{18q^2v^4}$