

[6-1]D Powers of Monomials

Review

Addition: $-10xy^2 + 2xy + 5xy^2 = -5xy^2 + 2xy$

Annotations: "Add" with arrows pointing to the coefficients of like terms, "Keep" with arrows pointing to the variables.

Multiplication:

$(-xy)(-3x^3y^5)(-2xy^2) = -6x^5y^8$

Annotations: "multiply" with arrows pointing to the coefficients, "Add" with arrows pointing to the exponents of like variables.

New

① $(m^3)^4 = m^{12}$

Annotation: A thought bubble shows $m \cdot m \cdot m \cdot m$ with a 3 above each m, and a 4 next to the whole expression.

$(a^m)^n = a^{mn}$

② $(x^2)^5 = x^{10}$

③ $(y^6)^7 = y^{42}$

④ $(4y^2)^3 = 64y^6$

Annotation: A thought bubble shows $(4y^2)(4y^2)(4y^2)$.

$(ab)^m = a^m b^m$

⑤ $(-5mn^2)^3 = -125m^3n^6$

⑥ $(-2xy^3)^4 = 16x^4y^{12}$

⑦ $(\frac{1}{2}p^2q)^3 \cdot (2pq^2)^4 = 2p^{10}q^{11}$

Annotation: A thought bubble shows $(\frac{1}{8}p^6q^3)(16p^4q^8)$.

$(\frac{1}{2})^3 = \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2}$

For # 8-11, $x = 3$ and $y = -2$

⑧

$$3x^3$$

$$3(3)^3 \text{ or } 3^1(3)^3$$

$$3 \cdot 27$$

$$81$$

$$3^4$$

$$81$$

⑨ $(3y)^2$

$$(3 \cdot -2)^2 \text{ or } 3^2 \cdot (-2)^2$$

$$(-6)^2$$

$$36$$

$$9 \cdot 4$$

$$36$$

⑩

$$3y^2$$

$$3(-2)^2$$

$$3 \cdot 4$$

$$12$$

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In Exercises 1–24, simplify.

1. $(c^2)^8$

2. $(2b)^3$

3. $(-3y^4)^2$

4. $(x^2)^7$

5. $(-2w)^3$

6. $(uv)^3$

7. $(a^2bc^3)^4$

8. $(xyz^5)^2$

9. $(2xy^3)^5$

10. $(2a^2b)^2$

11. $(-3xy^2z)^4$

12. $(3r^2s^3)^2$

13. $-(2y^3)^5$

14. $(-3uv)^4$

15. $(-2p^4)^4$

16. $(5u^2v^3)^2$

17. $(-2x^2y)^5$

18. $(10m^2n^3)^2$

19. $-(3u^3)^3$

20. $(7r^3s^4)^3$

21. $(b^3c^2)^6$

22. $(6a^2b^4)^2$

23. $(-a^2b^3)^5$

24. $(r^4s^6t^3)^3$

In Exercises 25–33, evaluate the expression if $x = 2$ and $y = 1$.

25. $x^2 \cdot x^5$

26. $(y^3)^2$

27. $(xy)^2$

28. $(x^2y)^3$

29. $x^2(y^2)^2$

30. $(xy^2)^3$

31. $(x^3y)(3x)$

32. $(3x^2)^2$

33. $(-3x)^3(y^3)^2$