**10.2 Video 1** Expand and Condense Exponents

NOTES

ALGEBRA

Write your questions here!

Base

Exponent (power)

---

base =

power =

base =

power =

## Condense

Write the following using exponents:

a. $4 \cdot 4 \cdot 4 \cdot 4 \cdot 4 \cdot 4$

b. $(-3)(-3)(-3)$

c. $\left(\frac{2}{5}\right)\left(\frac{2}{5}\right)\left(\frac{2}{5}\right)\left(\frac{2}{5}\right)\left(\frac{2}{5}\right)$

d. $x \cdot x \cdot x \cdot x$

e. $5 \cdot 5 \cdot y \cdot y \cdot y \cdot y \cdot y$

f. $3 \cdot 3 \cdot 3 \cdot x \cdot x \cdot y \cdot y \cdot y \cdot y$

## Expand

Write the following without using exponents:

a. $4^3$

b. $\left(\frac{2}{3}\right)^5$

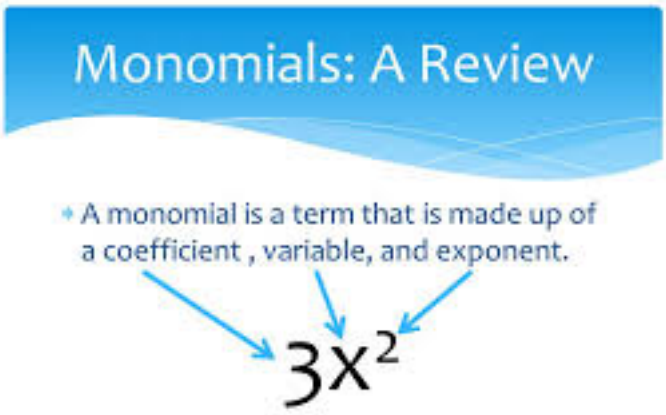
c. $(-3)^5$

d. $m^5$

e. $3^2x^5$

f. $5^4x^2y^3$

**VIDEO 1 PROBLEM SET -** TRY ON YOUR OWN




**Coefficient:** A number used to multiply a variable.

Example: 6z means 6 times z, and "z" is a variable, so 6 is a coefficient.

Variables with no number have a coefficient of 1.

Example: x is really 1x.

**Write the following using exponents. CONDENSE**

| 1. $4 \cdot 4 \cdot 4 \cdot 4$ | 2. $x \cdot x \cdot x \cdot x \cdot x \cdot x \cdot x$ | 3. $2 \cdot 2 \cdot y \cdot y \cdot y$ | 4. $\left(\frac{1}{4}\right)\left(\frac{1}{4}\right)\left(\frac{1}{4}\right)\left(\frac{1}{4}\right)\left(\frac{1}{4}\right)$ |
|---|---|---|---|
| **What is the base?** | **What is the base?** | **What is the base?** | **What is the base?** |
| **What is the exponent? (or power?)** | **What is the exponent? (or power?)** | **What is the exponent? (or power?)** | **What is the exponent? (or power?)** |
| | | **What is the coefficient?** | |

| 5. $3 \cdot 3 \cdot 3 \cdot x \cdot x \cdot y \cdot y \cdot y \cdot y$ | 6. $(-2)(-2)(m)(m)(m)$ | 7. $5 \cdot 5 \cdot m \cdot n \cdot n \cdot n \cdot n \cdot n$ |
|---|---|---|
| **What is the base?** | **What is the base?** | **What is the base?** |
| **What is the exponent? (or power?)** | **What is the exponent? (or power?)** | **What is the exponent? (or power?)** |
| **What is the coefficient?** | **What is the coefficient?** | **What is the coefficient?** |

| Write the following without using exponents. EXPAND | | | |
|---|---|---|---|
| 8. $7^5$ | 9. $m^3$ | 10. $6^3y^2$ | 11. $\left(\frac{2}{3}\right)^3$ |
| 12. $4^3w^2$ | 13. $\left(\frac{4}{5}\right)^3 x^4$ | 14. $2a^3b^4$ | 15. $3^2x^5y^2$ |

## 10.2 Video 2 - Product Rule of Exponents

**NOTES**


**Product (Multiply)**

a. $2^2 \cdot 2^5$

b. $\left(\frac{3}{4}\right)\left(\frac{3}{4}\right)^2$

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

d. $y^3 \cdot y^4$

e. $2x^3 \cdot 4x^4$

f. $(3^4d^2)(3d^4)$

**VIDEO 2 PROBLEM SET** - TRY ON YOUR OWN

| Write the following without using exponents and then simplify. PRODUCT (Multiply) | | | |
|---|---|---|---|
| 16. $4^2 \cdot 4^6$ | 17. $3^3 \cdot 3$ | 18. $2^4 \cdot 2^3 \cdot 2$ | 19. $x^4 \cdot x^2$ |
| 20. $2x^4 \cdot 3x^2$ | 21. $3y \cdot y$ | 22. $z^2 \cdot z \cdot z^3$ | 23. $3m^4(2m^2)$ |

## **10.2 Video 3** – Power Rule of Exponents

**NOTES**


**Power**

a. $(2^3)^2$

b. $(5^3)^4$

c. $(x^4)^2$

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

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

**VIDEO 3 PROBLEM SET -** TRY ON YOUR OWN

| **Write the following without using exponents and then simplify. POWER** | | |
|---|---|---|
| 24. $(3^5)^2$ | 25. $(7^4)^3$ | 26. $[(-5)^3]^4$ |
| 27. $(y^4)^6$ | 28. $(3n^5)^2$ | 29. $(7x^2y)^3$ |

## 10.2 Video 4 - Quotient of Exponents

**NOTES**


### Quotient (Divide)

a. $\frac{2^4}{2^2}$

b. $\frac{x^5}{x^3}$

c. $\frac{10x^7}{2x^2}$

d. $\frac{3y^6}{12y^4}$

e. $\frac{2^5x^4y^5}{2^2x^3y}$

**VIDEO 4 PROBLEM SET** - TRY ON YOUR OWN

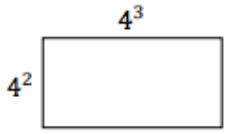
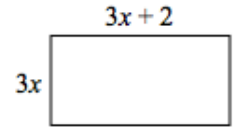
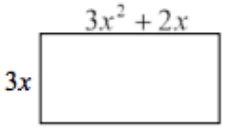
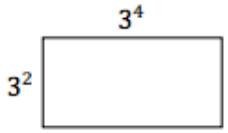
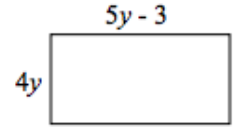
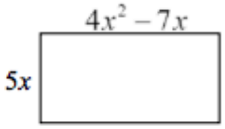
| **Write the following without using exponents and then simplify. QUOTIENT (Divide)** | | |
|---|---|---|
| 30. $\frac{4^5}{4^2}$ | 31. $\frac{h^8}{h^3}$ | 32. $\frac{15x^7}{3x^2}$ |
| 33. $\frac{3b^6}{12b^4}$ | 34. $\frac{2x^5y^3}{6x^2y}$ | 35. $\frac{4^5a^5b^3}{4^2a^3b^2}$ |

**VIDEO 4 PROBLEM SET -** TRY ON YOUR OWN FIRST
**APPLICATION**

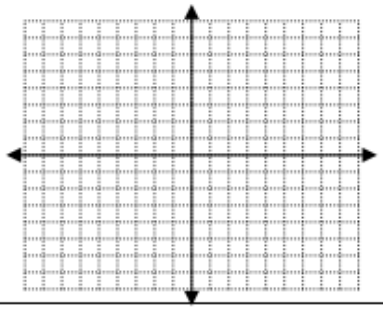
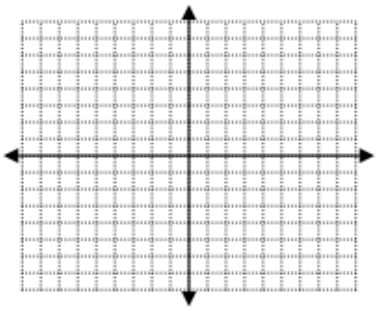
**Write the following without using exponents and then simplify.**

1. $(3x^2y^5)(2x^7y^4)$

2. $(3a^2)^3$

| **NUMERIC SOLUTIONS (number answers)** | **VARIABLE SOLUTIONS (letter answers)** | |
|---|---|---|
| 3. Find the area.<br>  | 4. Find the area.<br>  | 5. Find the area.<br>  |
| 6. Find the area.<br>  | 7. Find the area.<br>  | 8. Find the area.<br>  |

9. The volume of a cube is $V = s^3$. Find the volume of a cube with side, $s = 4y$

| SKILLZ REVIEW | | |
|---|---|---|
| **GRAPH** | **EVALUATE** | **SOLVE** |
| 1. $y = \frac{3}{4}x - 1$  | 2. $3a - 2b^2$, when $a = 4$ and $b = 3$ | 3. $4(2x - 5) = 2x$ |
| 4. $y = 4$  | 5. $d + \frac{3d}{2} - t$, when $d = -2$ and $t = 1$ | 6. $4(x - 5) + 1 = 2x - 5$ |