

For 1-2, find the sum or difference and write in standard form. Identify the constant terms, variable terms, and coefficients of the variable terms.

1. $(-3p+7)-(p^4-8p+9)$
 $(-3p+7)+(-p^4+8p-9)$

	$-3p+7$	
$+$	$-p^4$	$+8p-9$
	$-p^4$	$+5p-2$

Rewrite in standard form: $-p^4+5p-2$

Constant terms: -2

Variable terms: $-p^4, 5p$

Coefficients of the variable terms: $-1, 5$

2. $(d-6)+(5d+8)$

	$d-6$
$+$	$5d+8$
	$6d+2$

Rewrite in standard form: $6d+2$

Constant terms: 2

Variable terms: $6d$

Coefficients of the variable terms: 6

3. Is $-2x$ a polynomial? Explain your thinking.

Yes - it is a linear monomial.

Multiply the polynomials

4. $(k+6)(k-2)$

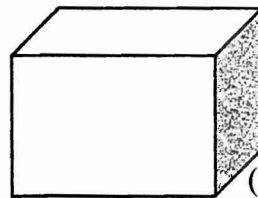
	k	$+6$
k	k^2	$+6k$
-2	$-2k$	-12

$\Rightarrow k^2-2k+6k-12$

$k^2+4k-12$

5. Write a simplified expression that represents the volume of the box.

$V = l \times w \times h$



$(x-3)(x-4)(x+2)$

	x	-3
\times	x^2	$-3x$
	$-4x$	$+12$

$\Rightarrow x^2-7x+12$

$(x+2) \text{ in}$

	x^2	$-7x$	$+12$
\times	x^3	$-7x^2$	$+12x$
$+2$	$+2x^2$	$-14x$	$+24$

$\Rightarrow x^3-5x^2-2x+24$

6. $(x-\frac{3}{7})(x-\frac{2}{7})$

	x	$-\frac{3}{7}$
\times	x^2	$-\frac{3}{7}x$
$-\frac{2}{7}$	$-\frac{2}{7}x$	$+\frac{6}{49}$

$\Rightarrow x^2-\frac{3}{7}x-\frac{2}{7}x+\frac{6}{49}$

$x^2-\frac{5}{7}x+\frac{6}{49}$

7. $(8v^2+3v-7)(3-4v)$

	$8v^2$	$+3v$	-7
3	$24v^2$	$9v$	-21
$-4v$	$-32v^3$	$-12v^2$	$+28v$

$24v^2-32v^3+9v-12v^2-21+28v$

$-32v^3+12v^2+37v-21$

Complete the blank with the either "rational" or "irrational".

8. The sum of 3 and $\sqrt{3}$ is a(n) IRRATIONAL number. Explain your response.
 3 is RATIONAL; $\sqrt{3}$ is NOT. SO IF THESE NUMBERS ARE ADDED, THE SUM IS IRRATIONAL.

9. The product of $(3+\sqrt{3})$ and $(3-\sqrt{3})$ is a(n) RATIONAL number. Explain your response.

$$\begin{array}{|c|c|} \hline 3 & 3\sqrt{3} \\ \hline \sqrt{3} & -\sqrt{3} \\ \hline \end{array} \Rightarrow 9 + 3\sqrt{3} - 3\sqrt{3} - \sqrt{3}\sqrt{3} = 9 - 3 = 6$$

IT IS A DIFFERENCE OF 2 SQUARES

Simplify. Write as a rational exponent or simplified root.

RADICAL EXPRESSION	RATIONAL EXPONENT
10. $\sqrt[3]{x^3} \cdot \sqrt{x^7}$	$x^{\frac{3}{3} \cdot \frac{2}{2}} \cdot x^{\frac{7}{2} \cdot \frac{5}{5}} \Rightarrow x^{\frac{6}{10} + \frac{35}{10}}$ $x^{\frac{41}{10}}$
11. $\sqrt[3]{(9a^7)^5} \Rightarrow \sqrt[3]{9^5 a^{35}}$ or $\sqrt[3]{59,049 a^{35}}$	$(9a^7)^{5/3}$

Simplify

12. $81^{-1/4} \Rightarrow \frac{1}{81^{1/4}} \Rightarrow \frac{1}{\sqrt[4]{81}} \Rightarrow \frac{1}{3}$	13. $(4a^2)^4 (a^2)^7$ $4^4 a^8 \cdot a^{14}$ $4^4 a^{22}$ $256 a^{22}$
14. $\left(\frac{6x^3y^0z^7}{2x^{-5}z^2}\right)^3$ \downarrow $\left(\frac{3x^8 \cdot 1}{z^5}\right)^3 \Rightarrow \frac{27x^{24}}{z^{15}}$	15. $3\sqrt{5} \cdot 4\sqrt{20}$ $\uparrow \uparrow \uparrow \uparrow$ $12 \cdot \sqrt{100}$ $12 \cdot 10$ 120

16. $\sqrt{\frac{2}{3}} \cdot \sqrt{\frac{5}{6}} \rightarrow \sqrt{\frac{10}{18}} \rightarrow \sqrt{\frac{5}{9}} \rightarrow \frac{\sqrt{5}}{\sqrt{9}} \rightarrow \boxed{\frac{\sqrt{5}}{3}}$

MULTIPLY SIMPLIFY BREAK UP

Solve:

17. $-4x^2 - 64 \neq 0$

$$+64 \quad +64$$

$$\frac{-4x^2 - 64}{-4} = \frac{64}{-4}$$

$$x^2 = -16$$

$$x = \pm\sqrt{-16}$$

No real solution

18. $6x^2 + 11 = 65$

$$-11 \quad -11$$

$$\frac{6x^2 + 11}{6} = \frac{54}{6}$$

$$x^2 = 9$$

$$x = \pm\sqrt{9}$$

$$x = 3, -3$$

19. $(2x-3)^2 = 16$

$$\sqrt{(2x-3)^2} = \pm\sqrt{16}$$

$$2x-3 = \pm 4$$

$$2x-3 = 4$$

$$+3 \quad +3$$

$$\frac{2x}{2} = \frac{7}{2}$$

$$x = \frac{7}{2}$$

$$2x-3 = -4$$

$$+3 \quad +3$$

$$\frac{2x}{2} = \frac{-1}{2}$$

$$x = -\frac{1}{2}$$

20. $\frac{49(x+2)^2}{49} = \frac{25}{49}$

$$\sqrt{(x+2)^2} = \sqrt{\frac{25}{49}}$$

$$(x+2) = \frac{\sqrt{25}}{\sqrt{49}}$$

$$x+2 = \pm\frac{5}{7}$$

$$x+2 = \frac{5}{7}$$

$$-2 \quad -2$$

$$x = \frac{5}{7} - 2$$

$$x+2 = -\frac{5}{7}$$

$$-2 \quad -2$$

$$x = -\frac{5}{7} - 2$$

$$x = -\frac{9}{7}, -\frac{19}{7}$$

$$x = \frac{5}{7} - 2 \rightarrow \frac{-9}{7}$$

$$x = -\frac{5}{7} - 2 \rightarrow \frac{-19}{7}$$

1. Convert $\sqrt[7]{x^3}$ to rational exponent form.

A. x^4

B. x^{-21}

C. $x^{\frac{3}{7}}$

D. $x^{\frac{7}{3}}$

2. Simplify the expression $16^{\frac{3}{4}}$.

A. 6

B. 12

C. 8

D. 64

$$\sqrt[4]{16^3} \text{ or } (\sqrt[4]{16})^3$$

$$\Downarrow$$

$$(2)^3$$

3. Subtract: $(-8h^2 - 5h + 8) - (9h^2 - 8h + 12)$

$$(-8h^2 - 5h + 8) + (-9h^2 + 8h - 12)$$

$$\begin{array}{r} -8h^2 - 5h + 8 \\ + \quad -9h^2 + 8h - 12 \\ \hline \end{array}$$

$$-17h^2 + 3h - 4$$

4. Multiply: $(3n - 8)(n + 1)$

	$3n$	-8	
n	$3n^2$	$-8n$	
$+1$	$3n$	-8	

$$\Rightarrow 3n^2 - 8n + 3n - 8$$

$$3n^2 - 5n - 8$$

5. What is the simplified form of $(27a^9)^{\frac{2}{3}}$

$$27^{\frac{2}{3}} a^{\frac{18}{3}}$$

$$(\sqrt[3]{27})^2 a^6$$

$$\Downarrow$$

$$(3)^2 a^6$$

$$9a^6$$