

Solve each equation.

1) $a^2 + 1 = 2$
 $\quad -1 \quad -1$

$$\sqrt{a^2} = \sqrt{1}$$

$$\boxed{a = \pm 1}$$

2) $h^2 - 32 = -32$
 $\quad +32 \quad +32$

$$\sqrt{h^2} = \sqrt{0}$$

$$\boxed{h = 0}$$

3) $m^2 + 7 = 6$
 $\quad -7 \quad -7$

$$\sqrt{m^2} = \sqrt{-1}$$

$m = \emptyset$ ← (for now we don't know $\sqrt{\text{of negative \#s}}$ we learn it in unit 7)

4) $x^2 - 1 = 80$
 $\quad +1 \quad +1$

$$\sqrt{x^2} = \sqrt{81}$$

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

5) $7x^2 - 6 = 57$
 $\quad +6 \quad +6$

$$\frac{7x^2}{7} = \frac{63}{7}$$

$$\sqrt{x^2} = \sqrt{9}$$

$$\boxed{x = \pm 3}$$

6) $10x^2 + 9 = 499$
 $\quad -9 \quad -9$

$$\frac{10x^2}{10} = \frac{490}{10}$$

$$\sqrt{x^2} = \sqrt{49}$$

$$\boxed{x = \pm 7}$$

7) $7w^2 + 3 = -60$
 $\quad -3 \quad -3$

$$\frac{7w^2}{7} = \frac{-63}{7}$$

$$\sqrt{w^2} = \sqrt{-9}$$

$w = \emptyset$ (for now!)

8) $8y^2 - 9 = 639$
 $\quad +9 \quad +9$

$$\frac{8y^2}{8} = \frac{648}{8}$$

$$\sqrt{y^2} = \sqrt{81}$$

$$\boxed{y = \pm 9}$$

9) $\sqrt{(p-4)^2} = \sqrt{16}$ $\sqrt{\text{group}^2} = \sqrt{16}$

$p-4 = \pm 4$ $\text{group} = \pm 4$

New problems

$\frac{p-4}{+4 \quad +4} = \frac{4}{+4 \quad +4}$ or $\frac{p-4}{+4 \quad +4} = \frac{-4}{+4 \quad +4}$

$$\boxed{p = 8}$$

$$\boxed{p = 0}$$

10) $(2k-1)^2 = 9$

$2k-1 = \pm 3$

$\sqrt{\text{group}^2} = \sqrt{9}$

$\text{group} = \pm 3$

New problems

$2k-1 = 3$ or $2k-1 = -3$

$$\frac{2k}{2} = \frac{4}{2}$$

$$\boxed{k = 2}$$

$$\frac{2k}{2} = \frac{-2}{2}$$

$$\boxed{k = -1}$$

(There is a back!)

Use the rules of exponents (1st unit) to simplify each expression.

11) $x^3 \cdot x^7$

$$\begin{array}{c} 3+7 \\ \boxed{x^{10}} \end{array}$$

12) $2a^3b^6 \cdot 5a^4b$

$$\begin{array}{c} 2 \cdot 5 \cdot a^{3+4} \cdot b^{6+1} \\ \boxed{10a^7b^7} \end{array}$$

13) $\frac{g^{12}}{g^2}$

$$\begin{array}{c} 12-2 \\ g \\ \boxed{g^{10}} \end{array}$$

14) $\frac{3m^4p^3}{6m^3p^3}$

$$\begin{array}{c} \frac{3}{6} m^{4-3} p^{3-3} \\ \frac{1}{2} m^1 p^0 \Rightarrow \frac{m}{2} \cdot 1 \Rightarrow \boxed{\frac{m}{2}} \end{array}$$

15) $5x^{-3}$

$$5 \cdot \frac{1}{x^3} = \boxed{\frac{5}{x^3}}$$

16) $(2x^4)^3$

$$\begin{array}{c} 2^3 \cdot x^{4 \cdot 3} \\ \boxed{8x^{12}} \end{array}$$

17) $5^2 \cdot 4^2$ ← same exponent

$$\begin{array}{c} (5 \cdot 4)^2 \\ (20)^2 \\ \boxed{400} \end{array}$$

18) $20^0 \cdot 4^0$ ← same exponent

$$\begin{array}{c} (20 \cdot 4)^0 \\ (80)^0 \\ \boxed{1} \end{array}$$