

Operations with Variables  
Algebra 2

KEY

Simplify the following expressions.

- |  |   |  |   |
|--|---|--|---|
| 1) $x + x$<br>$2x$   | 2) $y + y + y$<br>$3y$  | 3) $x + x + y + y$<br>$2x + 2y$                                      | 4) $a + b + c + b$<br>$a + 2b + c$  |
| 5) $a + b + a - b + a$<br>$3a$   | 6) $j + k - j - k$<br>$0$   | 7) $p - q - q + p - q$<br>$2p - 3q$                                  |   |
| 8) $-x + y - x + y - y + z$<br>$-2x + y + z$                                   | 9) $t - v + t - w - v + t - v + w$<br>$3t - 3v$                     |  |   |
| 10) $x \cdot x$<br>$x^2$   | 11) $b \cdot b \cdot b$<br>$b^3$                                    | 12) $a \cdot a \cdot b \cdot b$<br>$a^2b^2$                          | 13) $b \cdot b \cdot c$<br>$b^2c$   |
| 14) $x \cdot x \cdot y \cdot z \cdot y \cdot z \cdot y$<br>$x^2y^3z^2$         | 15) $-j \cdot k \cdot j$<br>$-j^2k$                                 | 16) $p \cdot p \cdot q (-q)$<br>$-p^2q^2$                            |   |
| 17) $b (-b) c \cdot d (-b)(-c)$<br>$-b^3c^2d$                                  | 18) $(-x) y \cdot z (-x) y$<br>$x^2y^2z$                            | 19) $(-p)(-q) \cdot t (-t)(-p)(-q)$<br>$-p^2q^2t^2$                  |   |
| 20) $\frac{b}{b}$<br><br>1, $b \neq 0$   | 21) $\frac{x+x}{x}$<br><br>$\frac{2x}{x}$<br>2, $x \neq 0$          | 22) $\frac{z}{z+z}$<br><br>$\frac{z}{2z}$<br>$\frac{1}{2}, z \neq 0$ | 23) $\frac{c+c+c+c+c}{c+c}$<br><br>$\frac{5c}{2c}$<br>$\frac{5}{2}, c \neq 0$ |
| 24) $\frac{-q-q-q}{q+q+q+q+q+q+q}$<br><br>$\frac{-3q}{7q}$<br>$-3/7, q \neq 0$ | 25) $\frac{a+a}{b+b+b+b}$<br><br>$\frac{2a}{4b} \quad \frac{a}{2b}$ | 26) $\frac{j+j+j+j}{k+k+k}$<br><br>$\frac{4j}{3k}$                   |   |

$$27) \frac{q+q-q+q-q+q+q}{t+t}$$

$$\frac{3q}{2t}$$

$$28) \frac{y+y+y+y}{y+y+y+y+y}$$

$$\frac{4y}{5y}$$

$$4/5, y \neq 0$$

$$29) \frac{m+m+m}{n+n+n+n+n+n+n+n+n}$$

$$\frac{3m}{9n}$$

$$\frac{m}{3n}$$