

# 21. [Algebra - Like Terms]

## Skill 21.1 Adding the same variables (no coefficients).

MMBlue 1 1 2 2 3 3 4 4  
MMGreen 1 1 2 2 3 3 4 4

In Algebra a term is made up of letters (variables) and/or numbers multiplied together:

$a$ ,  $cd$ ,  $4mn$ ,  $2y$ ,  $10x$

Different combinations of terms form expressions:  $a + 3b$ ,  $xy - 5x + 4y$ ,  $5pq - 3p + 2q$

Terms that are expressed as multiples of the same variables are called 'like terms':  $3a$  and  $5a$

Rule: Only like terms can be added or subtracted to simplify an expression.

Numbers before variables are called coefficients.

In the term  $3j$ , 3 is the coefficient:  $3j = 3 \times j$

In the term  $m$ , 1 is the coefficient:  $m = 1 \times m$

**Q.** Simplify  
 $m + m$

**A.**  $m + m$   
 $= 1m + 1m$   
 $= 2m$

$m$  and  $m$  are like terms, so they can be added.  
 $m$  can also be written as  $1m$ .  
Add the numbers and copy the letter.

**Q.** Simplify  
 $vw + vw + vw$

**A.**  $vw + vw + vw$   
 $= 1vw + 1vw + 1vw$   
 $= 3vw$

$vw$  and  $vw$  are like terms, so they can be added.  
 $vw$  can also be written as  $1vw$ .  
Add the numbers and copy the letters.

**a)** Simplify  
 $g + g + g$   
 $= 3g$

**b)** Simplify  
 $t + t + t + t + t$   
 $=$  .....

**c)** Simplify  
 $e + e + e + e$   
 $=$  .....

**d)** Simplify  
 $h + h + h + h + h$   
 $=$  .....

**e)** Simplify  
 $b + b + b + b$   
 $=$  .....

**f)** Simplify  
 $w + w + w$   
 $=$  .....

**g)** Simplify  
 $jk + jk + jk$   
 $= 3jk$

**h)** Simplify  
 $ab + ab$   
 $=$  .....

**i)** Simplify  
 $ij + ij + ij + ij + ij$   
 $=$  .....

**j)** Simplify  
 $st + st + st + st$   
 $=$  .....

**k)** Simplify  
 $mn + mn + mn$   
 $=$  .....

**l)** Simplify  
 $st + st + st + st$   
 $=$  .....

**m)** Simplify  
 $yz + yz + yz$   
 $=$  .....

**n)** Simplify  
 $cd + cd + cd + cd$   
 $=$  .....

**o)** Simplify  
 $xyz + xyz + xyz$   
 $=$  .....

**Q.** Simplify  
 $3q + 2q + q$

**A.**  $3q + 2q + q$   
 $= 5q + 1q$   
 $= 6q$

$3q$ ,  $2q$  and  $q$  are like terms.  
 $q$  can also be written as  $1q$ .  
Add the numbers and copy the letter.

**Q.** Simplify  
 $6jk - 4jk$

**A.**  $6jk - 4jk$   
 $= 2jk$

$6jk$  and  $4jk$  are like terms, so  
they can be subtracted.  
Subtract the numbers and copy the letters.

**Q.** Simplify  
 $4t + 2t - t$

**A.**  $4t + 2t - t$   
 $= 6t - t$   
 $= 5t$

$4t$ ,  $2t$  and  $t$  are like terms, so they can  
be added and subtracted.  
First add  $4t$  and  $2t$ .  
Then subtract  $t$  from  $6t$ .

**a)** Simplify  
 $2s + 4s + 4s$   
 $= 6s + 4s$   
 $= 10s$

**b)** Simplify  
 $5u + u + 2u$   
 $= \dots\dots\dots$   
 $= \dots\dots\dots$

**c)** Simplify  
 $7w + 4w + 3w$   
 $= \dots\dots\dots$   
 $= \dots\dots\dots$

**d)** Simplify  
 $h + 6h + 3h$   
 $= \dots\dots\dots$   
 $= \dots\dots\dots$

**e)** Simplify  
 $7ab + ab + ab$   
 $= 8ab + ab$   
 $= 9ab$

**f)** Simplify  
 $yz + 5yz + 2yz$   
 $= \dots\dots\dots$   
 $= \dots\dots\dots$

**g)** Simplify  
 $5yz - 3yz$   
 $= 2yz$

**h)** Simplify  
 $10xy - xy$   
 $= \dots\dots\dots$

**i)** Simplify  
 $5lm - 5lm$   
 $= \dots\dots\dots$

**j)** Simplify  
 $6ab - 5ab$   
 $= \dots\dots\dots$

**k)** Simplify  
 $5gh - gh$   
 $= \dots\dots\dots$

**l)** Simplify  
 $7mn - 2mn$   
 $= \dots\dots\dots$

**m)** Simplify  
 $8de - de + 2de$   
 $= \dots\dots\dots$   
 $= \dots\dots\dots$

**n)** Simplify  
 $tu + 4tu - 2tu$   
 $= \dots\dots\dots$   
 $= \dots\dots\dots$

**o)** Simplify  
 $3fg - fg + 6fg$   
 $= \dots\dots\dots$   
 $= \dots\dots\dots$

**Q.** Simplify  
 $j + j + k - j$

**A.**  $j + j + k - j$   
 $= (j + j - j) + k$   
 $= (2j - j) + k$   
 $= j + k$

Group like terms:  $j + j - j$   
 Add and subtract like terms.  
 $j$  and  $k$  are not like terms, so leave the answer as  $j + k$ .

**Q.** Simplify  
 $6f + 5g - f - 2g$

**A.**  $6f + 5g - f - 2g$   
 $= (6f - f) + (5g - 2g)$   
 $= 5f + 3g$

Group like terms:  $6f - f$  and  $5g - 2g$   
 Subtract like terms.  
 $5f$  and  $3g$  are not like terms, so leave the answer as  $5f + 3g$ .

**a)** Simplify  
 $a + e + a + a$   
 $= (a + a + a) + e$   
 $= 3a + e$

**b)** Simplify  
 $p + s + p$   
 $= \dots\dots\dots$   
 $= \dots\dots\dots$

**c)** Simplify  
 $d + e - d + e$   
 $= \dots\dots\dots$   
 $= \dots\dots\dots$

**d)** Simplify  
 $s + w + w$   
 $= \dots\dots\dots$   
 $= \dots\dots\dots$

**e)** Simplify  
 $y + y + p - y + p$   
 $= \dots\dots\dots$   
 $= \dots\dots\dots$

**f)** Simplify  
 $h + e + h + e$   
 $= \dots\dots\dots$   
 $= \dots\dots\dots$

**g)** Simplify  
 $m + p - m$   
 $= \dots\dots\dots$   
 $= \dots\dots\dots$

**h)** Simplify  
 $k + k + h + k$   
 $= \dots\dots\dots$   
 $= \dots\dots\dots$

**i)** Simplify  
 $i + i + s + s + i$   
 $= \dots\dots\dots$   
 $= \dots\dots\dots$

**j)** Simplify  
 $4s + 2 + 2s + 3$   
 $= (4s + 2s) + 3 + 2$   
 $= 6s + 5$

**k)** Simplify  
 $2u + u + 3p - 2p$   
 $= \dots\dots\dots$   
 $= \dots\dots\dots$

**l)** Simplify  
 $7w + 4x + 3w$   
 $= \dots\dots\dots$   
 $= \dots\dots\dots$

**m)** Simplify  
 $a + 6a + 3a - 2$   
 $= \dots\dots\dots$   
 $= \dots\dots\dots$

**n)** Simplify  
 $7d + 5x - d - 3x$   
 $= \dots\dots\dots$   
 $= \dots\dots\dots$

**o)** Simplify  
 $h + m + 7h - 7h$   
 $= \dots\dots\dots$   
 $= \dots\dots\dots$