

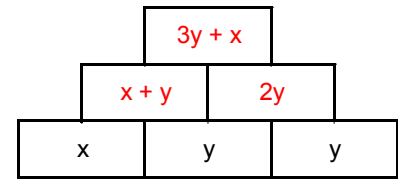
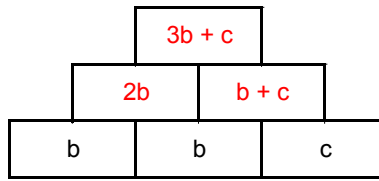
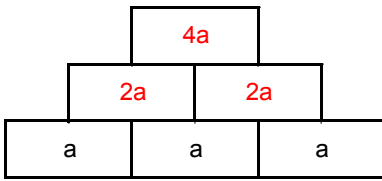
# Algebra Addition Pyramids (A)



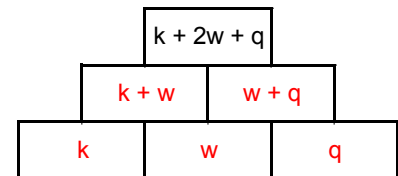
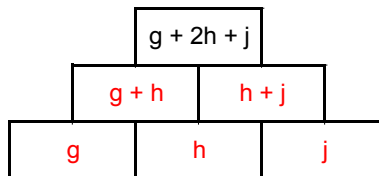
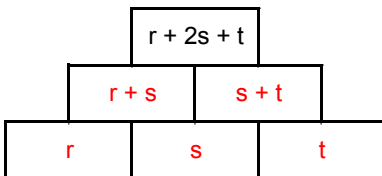
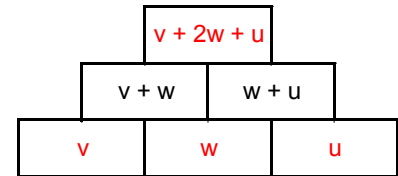
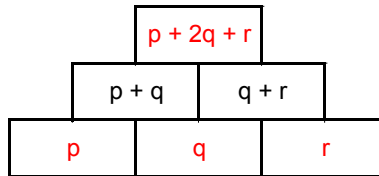
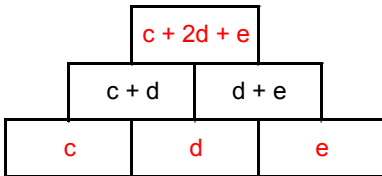
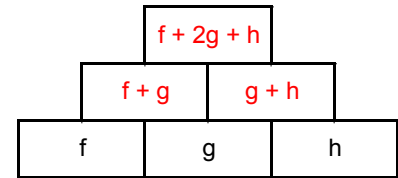
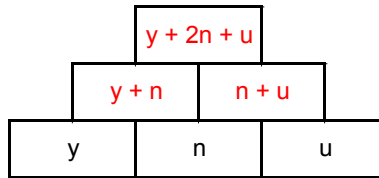
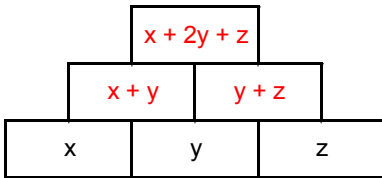
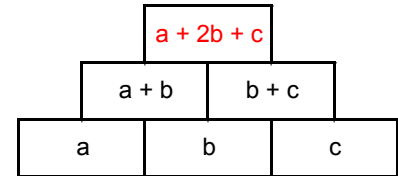
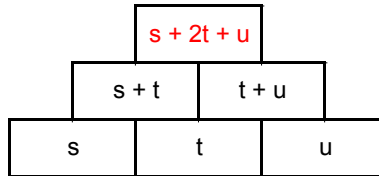
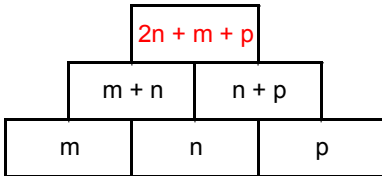
## ANSWERS

Add the two blocks beneath.

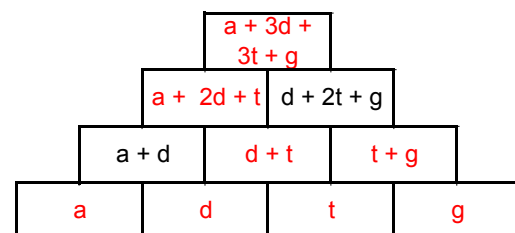
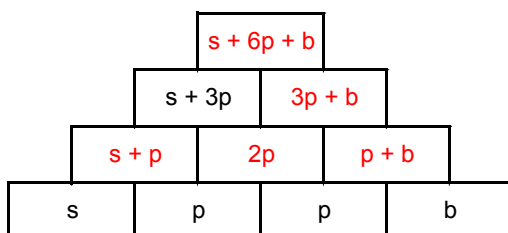
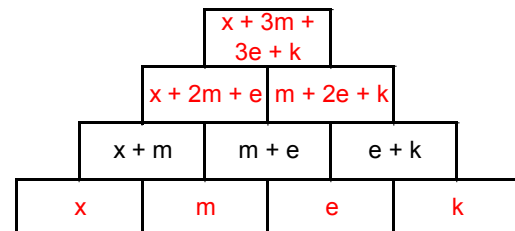
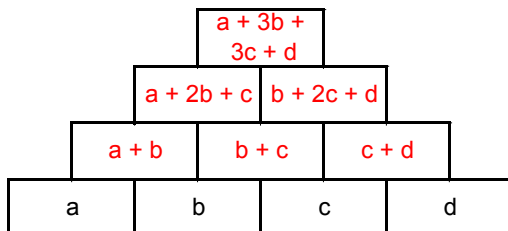
### Section A



### Section B



### Section C



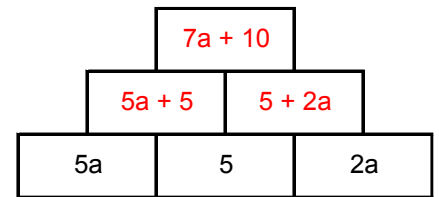
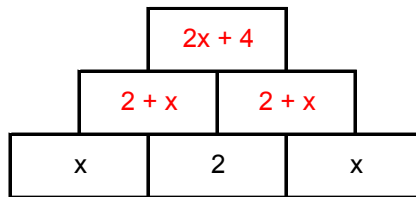
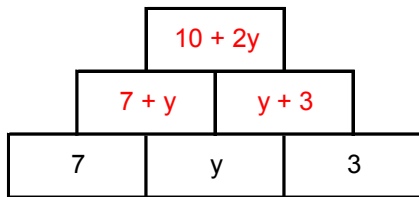
# Algebra Addition Pyramids (B)

## ANSWERS

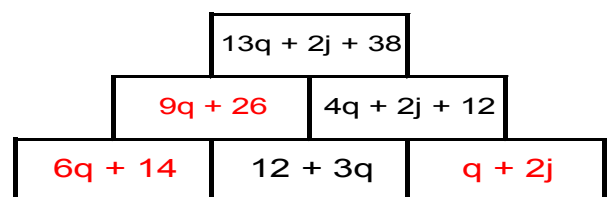
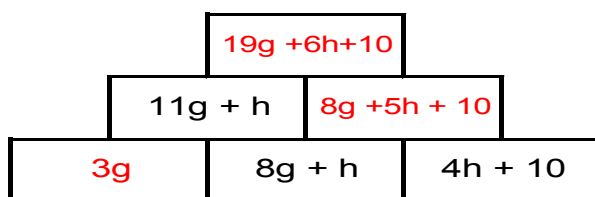
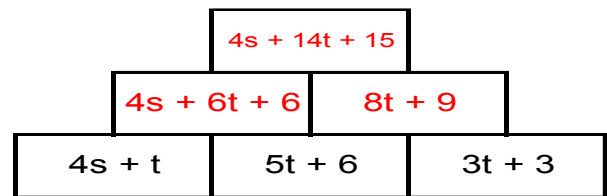
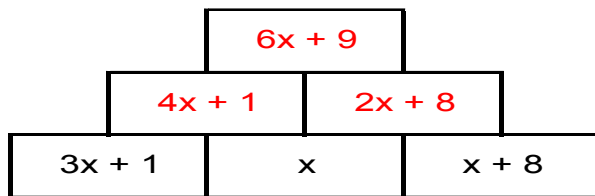
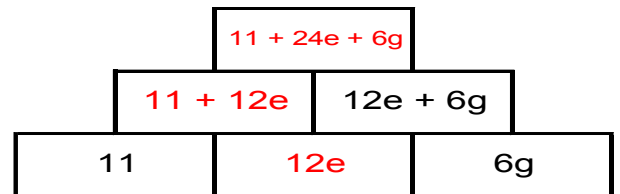
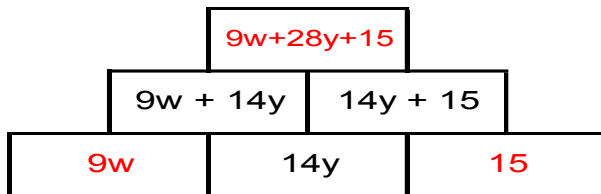
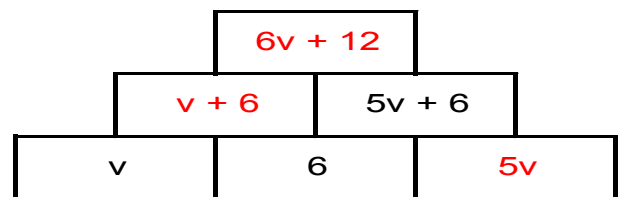
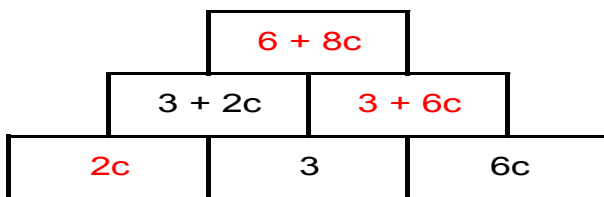
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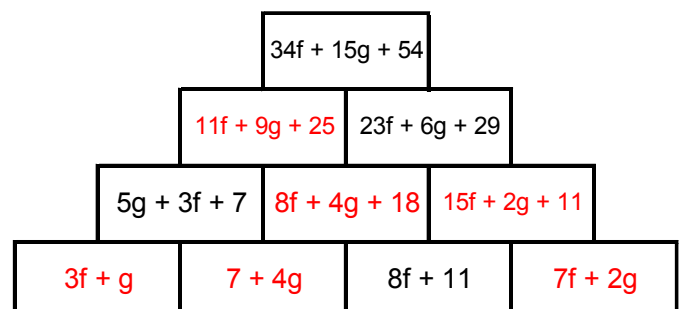
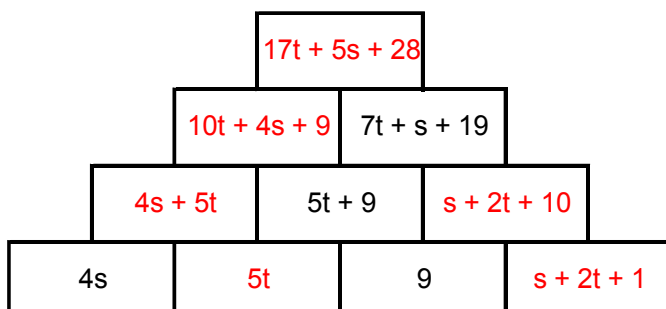
### Section A



### Section B



### Section C



# Simplifying Expressions

## ANSWERS



### Section A

- |   |   |  |
|---|---|--|
| 1) $x + 3x + 4 + 3$ <b><math>4x + 7</math></b>      | 6) $2x + 3 + 5x + 11$ <b><math>5x + 14</math></b>   | 11) $2c + 3d + 5c + e$ <b><math>7c + 3d + e</math></b>           |
| 2) $5a + 2a + 8 + 6$ <b><math>7a + 14</math></b>    | 7) $12 + 5r + 2 + 4r$ <b><math>9r + 14</math></b>   | 12) $7 + 5x + 3 + 7y$ <b><math>7y + 5x + 10</math></b>           |
| 3) $7 + 2 + 6y + 3y$ <b><math>9 + 9y</math></b>     | 8) $7y + 4 + y + 6$ <b><math>8y + 10</math></b>     | 13) $9v + 2 + 14v + 8q$ <b><math>23v + 8q + 2</math></b>         |
| 4) $8d + 6d + 7 + 1$ <b><math>14d + 8</math></b>    | 9) $7u + 5v + u + v$ <b><math>8u + 6v</math></b>    | 14) $3p + 4 + p + 3s + 5$ <b><math>4p + 3s + 9</math></b>        |
| 5) $3h + 2h + 7g + 9g$ <b><math>5h + 16g</math></b> | 10) $9i + 4f + i + 3f$ <b><math>10i + 7f</math></b> | 15) $7n + k + 4k + 8n + 3m$<br><b><math>15n + 3m + 5k</math></b> |

### Section B

- |                                      |                                      |                                       |
|--------------------------------------|--------------------------------------|---------------------------------------|
| 1) $-x + 2x$ <b><math>x</math></b>   | 6) $2x - 6x$ <b><math>-4x</math></b> | 11) $5x - 9x$ <b><math>-4x</math></b> |
| 2) $4a - 6a$ <b><math>-2a</math></b> | 7) $5r - 4r$ <b><math>r</math></b>   | 12) $-8v + 8v$ <b><math>0</math></b>  |
| 3) $-4y + 3y$ <b><math>-y</math></b> | 8) $-7y - y$ <b><math>-8y</math></b> | 13) $3p - 6p$ <b><math>-3p</math></b> |
| 4) $-2d + d$ <b><math>-d</math></b>  | 9) $-4v + 7v$ <b><math>3v</math></b> | 14) $-k + 3k$ <b><math>2k</math></b>  |
| 5) $-3g + 5g$ <b><math>2g</math></b> | 10) $-2c + c$ <b><math>-c</math></b> |                                       |

### Section C

- |  |  |   |
|--|--|---|
| 1) $4x - x + 5 - 2$ <b><math>3x - 3</math></b>       | 8) $7y + 4 - y + 8$ <b><math>6y + 12</math></b>      | 15) $7n + k + 4k - 8n$ <b><math>-n + 5k</math></b>      |
| 2) $9a - 7a + 7 - 4$ <b><math>2a + 3</math></b>      | 9) $7u + 5v - u + 6v$ <b><math>6u + 11v</math></b>   | 16) $3x + 4y + 6x - 8y$ <b><math>9x - 4y</math></b>     |
| 3) $9 - 1 + 8y - 3y$ <b><math>8 + 5y</math></b>      | 10) $9i + 4f - i + 2f$ <b><math>8i + 6f</math></b>   | 17) $7p - 4s + 2p + 2s$ <b><math>9p - 2s</math></b>     |
| 4) $11d - 6d + 10 - 1$ <b><math>5d + 9</math></b>    | 11) $4c + 3d - c + 4d$ <b><math>3c + 7d</math></b>   | 18) $5z + 8s - 9z + 9s$ <b><math>-4z + 17s</math></b>   |
| 5) $12h - 2h + 4g - 6g$ <b><math>10h - 2g</math></b> | 12) $7 + 5x - 9 + 7x$ <b><math>12x - 2</math></b>    | 19) $-2a + 11b + 5a + b$ <b><math>3a + 12b</math></b>   |
| 6) $2x - 5x + 1 - 4$ <b><math>-3x - 3</math></b>     | 13) $9v + 2 - 11v + 8$ <b><math>-2v + 10</math></b>  | 20) $-s + 4p + 6s + 2p$ <b><math>5s + 6p</math></b>     |
| 7) $2r - 4r + 6 - 10$ <b><math>-2r - 4</math></b>    | 14) $3p + 4s - 6p + 2s$ <b><math>-3p + 6s</math></b> | 21) $-8j + 12s + 6j + 6s$ <b><math>-2j + 18s</math></b> |

### Section D

- |  |  |  |
|--|--|--|
| 1) $x - 2y - 3x + 4y$ <b><math>-2x + 2y</math></b>   | 8) $10y - 5z - y - 3z$ <b><math>9y - 8z</math></b>               | 15) $7n + k - 8k - 8n + 3m$ <b><math>-n - 7k + 3m</math></b>       |
| 2) $5a - 2b - 8b + 6a$ <b><math>11a - 10b</math></b> | 9) $9u - v - 11u + v$ <b><math>-2u</math></b>                    | 16) $2x - 9y - 6x - 8y + 7z$ <b><math>-4x - 17y + 7z</math></b>    |
| 3) $7v + 2w - 6v - 3w$ <b><math>-w + v</math></b>    | 10) $15i - 4f - 17i + 3f$ <b><math>-2i - f</math></b>            | 17) $11p - 4s + 5r - 3p + 2s - r$ <b><math>8p - 2s + 4r</math></b> |
| 4) $8d - 6e + 9e - 5d$ <b><math>3d + 3e</math></b>   | 11) $16t - t - 5s - 9t$ <b><math>6t - 5s</math></b>              | 18) $5z - 8s - 9t + 9s + t$ <b><math>5z + s - 8t</math></b>        |
| 5) $3g + 2h - 7g + 9g$ <b><math>5g + 2h</math></b>   | 12) $19 - 5x - 8 + 7x$ <b><math>2x + 11</math></b>               | 19) $a - c - 11b + a + b - 3c$ <b><math>-4c + 2a - 10b</math></b>  |
| 6) $2x - 3 + 4x + 11$ <b><math>6x + 8</math></b>     | 13) $9v + 2v - 14v + 8q$ <b><math>-3v + 8q</math></b>            | 20) $-s + 4p + 6s + 2p - 5s$ <b><math>6p</math></b>                |
| 7) $12 - 5r - 2 + 4r$ <b><math>-r + 10</math></b>    | 14) $2c - 6d - 13c + 11e$<br><b><math>-11c - 6d + 11e</math></b> | 21) $8j - 3 - 2s + 6j + 6s - 13$ <b><math>14j + 4s - 16</math></b> |

### Section E

- |  |   |   |
|--|---|---|
| 1) $xy + 3xy$ <b><math>4xy</math></b>            | 5) $y^2 + y^2 + y^2$ <b><math>3y^2</math></b> | 9) $8xy^2 + xy - 2xy^2 - xy$ <b><math>6xy^2</math></b>                  |
| 2) $2ab + 4ab$ <b><math>6ab</math></b>           | 6) $b^2 - b^2 - b^2$ <b><math>-b^2</math></b> | 10) $gh + h^2 + 3gh + 2h^2$ <b><math>4gh + 3h^2</math></b>              |
| 3) $5st - st$ <b><math>4st</math></b>            | 7) $4u^3 + 9u^3$ <b><math>13u^3</math></b>    | 11) $uv - v^2 + u^2 - uv - u$ <b><math>-v^2 + u^2 - u</math></b>        |
| 4) $4cd + 7c - 2cd$ <b><math>2cd + 7c</math></b> | 8) $xy^2 + xy^2$ <b><math>2xy^2</math></b>    | 12) $7ab^2 - 7a^2b + a^2b - 4ab^2$<br><b><math>3ab^2 - 6a^2b</math></b> |

# Algebraic Multiplication Grids

**ANSWERS**

## Section A

X	a	b	c	d
2	2a	2b	2c	2d
3	3a	3b	3c	3d
4	4a	4b	4c	4d
a	$a^2$	ab	ac	ad

X	2a	3b	7c	4d
5	10a	15b	35c	20d
7	14a	21b	49c	28d
4	8a	12b	28c	16d
3	6a	9b	21c	12d

X	w	4y	z	3
w	$w^2$	4wy	wz	3w
3y	3wy	$12y^2$	3yz	9y
5	5w	20y	5z	15
9z	9wz	36yz	$9z^2$	27z

X	st	tu	uv	su
2s	$2s^2t$	2stu	2suv	$2s^2u$
3t	$3st^2$	$3t^2u$	3tuv	3stu
7u	7stu	$7tu^2$	$7u^2v$	$7su^2$
v	stv	tuv	$uv^2$	suv

X	p	2g	$e^2$	ej
q	pq	2gq	$e^2q$	eq
3g	3gp	$6g^2$	$3e^2g$	3egj
7h	7hp	14gh	$7he^2$	7ehj
e	ep	2eg	$e^3$	$e^2j$

X	3t	3s	s	2
4t	$12t^2$	12st	4st	8t
3st	$9st^2$	$9s^2t$	$3s^2t$	6st
$6s^2$	$18s^2t$	$18s^3$	$6s^3$	$12s^2$
$st^2$	$3st^3$	$3s^2t^2$	$s^2t^2$	$2st^2$

## Section B

- |   |   |   |
|---|---|---|
| 1) $ab \times c$ <b>abc</b>                                 | 2) $2 \times a \times b$ <b>2ab</b>                 | 3) $d \times c \times 5$ <b>5cd</b>                           |
| 4) $f \times f \times 8$ <b><math>8f^2</math></b>           | 5) $n \times n \times n$ <b><math>n^3</math></b>    | 6) $ab \times a \times b$ <b><math>a^2b^2</math></b>          |
| 7) $3 \times w \times 4 \times w$ <b><math>12w^2</math></b> | 8) $j \times 2f \times 7w$ <b>14fjw</b>             | 9) $5u \times u \times 5v$ <b><math>25u^2v</math></b>         |
| 10) $4r^2 \times r$ <b><math>4r^3</math></b>                | 11) $5kl \times 9k^2$ <b><math>45k^3l</math></b>    | 12) $3xy \times 3y^2$ <b><math>9xy^3</math></b>               |
| 13) $abc \times ac \times 4$ <b><math>4a^2bc^2</math></b>   | 14) $8d^2e \times 3de$ <b><math>24d^3e^2</math></b> | 15) $s^2 \times 7st \times 9t^2$ <b><math>63s^3t^3</math></b> |

# Expanding Single Brackets (B)



## ANSWERS

### Section A

- |                         |                           |
|-------------------------|---------------------------|
| 1) $7(b + 4)$ $7b + 28$ | 4) $8(2 + y)$ $16 + 8y$   |
| 2) $9(s + 5)$ $9s + 45$ | 5) $3(11 - 3d)$ $33 - 9d$ |
| 3) $8(7 + f)$ $56 + 8f$ | 6) $6(2e - 8)$ $12e - 48$ |

### Section B

- |                          |                          |
|--------------------------|--------------------------|
| 1) $a(2 + a)$ $2a + a^2$ | 4) $j(7 - j)$ $7j - j^2$ |
| 2) $g(g - 6)$ $g^2 - 6g$ | 5) $u(4 - u)$ $4u - u^2$ |
| 3) $w(w + 2)$ $w^2 + 2w$ | 6) $p(p + s)$ $p^2 + ps$ |

### Section C

- |                              |                               |
|------------------------------|-------------------------------|
| 1) $2c(5 + c)$ $10c + 2c^2$  | 4) $3d(7 - 2d)$ $21d - 6d^2$  |
| 2) $8h(4 - h)$ $32h - 8h^2$  | 5) $5t(5t - 2)$ $25t^2 - 10t$ |
| 3) $4r(2r + 7)$ $8r^2 + 28r$ | 6) $3z(6z + 9)$ $18z^2 + 27z$ |

### Section D

- |                               |                                    |
|-------------------------------|------------------------------------|
| 1) $7y(3y + x)$ $21y^2 + 7xy$ | 4) $2w(v - 2w)$ $2vw - 4w^2$       |
| 2) $9q(3q - p)$ $27q^2 - 9pq$ | 5) $9h(6h - 2g)$ $54h^2 - 18gh$    |
| 3) $5t(8t + s)$ $40t^2 + 5st$ | 6) $12b(3b + b^2)$ $36b^2 + 12b^3$ |

### Section E: (Level 7!)

x	$(2a - b)$	$(7b + ab)$	$(2a^2 - 7a)$	$(abc + a)$
-3	$-6a + 3b$	$-21b - 3ab$	$-6a^2 + 21a$	$-3abc - 3a$
-2a	$-4a^2 + 2ab$	$-14ab - 2a^2b$	$-4a^3 + 14a^2$	$-2a^2bc - 2a^2$
4b	$8ab - 4b^2$	$28b^2 + 4ab^2$	$8a^2b - 28ab$	$4ab^2c + 4ab$
2ab	$4a^2b - 2ab^2$	$14ab^2 + 2a^2b^2$	$4a^3b - 14a^2b$	$2a^2b^2c + 2a^2b$

# Factorising Expressions (B)



## ANSWERS

Factorise the following quadratic expressions fully.

### Section A

- |                                 |   |
|---------------------------------|---|
| 1) $8x + 24$ $8(x + 3)$         | 10) $72wz + 45w^2z$ $9wz(8 + 5w)$               |
| 2) $15 + 25y$ $5(3 + 5y)$       | 11) $22x^2y - 55xy^2$ $11xy(2x - 5y)$           |
| 3) $32 - 40w$ $8(4 - 5w)$       | 12) $16k^3 + 24k^2$ $8k^2(2k + 3)$              |
| 4) $18c - 36$ $18(c - 2)$       | 13) $9h^2g - 15h^3$ $3h^2(3g - 5h)$             |
| 5) $16d^2 - 4d$ $4d(4d - 1)$    | 14) $12c^2d^2 + 20c^3$ $4c^2(3d^2 + 5c)$        |
| 6) $12s + 60s^2$ $12s(1 + 5s)$  | 15) $28a^3b^2 - 7a^2b$ $7a^2b(4ab - 1)$         |
| 7) $21xy + 14x$ $7x(3y + 2)$    | 16) $60x^2y^3 - 35xy^2$ $5xy^2(12xy - 7)$       |
| 8) $27ab - 18a^2$ $9a(3b - 2a)$ | 17) $88s^4t + 56s^3t^2$ $8s^3t(11s + 7t)$       |
| 9) $12s^2t + 28s$ $4s(3s + 7)$  | 18) $36p^3q^4 - 48p^4q^2$ $12p^3q^2(3q^2 - 4p)$ |

### Section B

- |   |  |
|---|--|
| 1) $6 - 12gh + 3h$ $3(2 - 4gh + h)$                   | 10) $2x + xy - x^2$ $x(2 + y - x)$   |
| 2) $21st - 7t + 14$ $7(3st - t + 2)$                  | 11) $5k^2 - 10jk + k$ $k(5k - 10j + 1)$  |
| 3) $22 - 44vw + 11v$ $11(2 - 4vw + v)$                | 12) $9cd - 3c^2d + 12c$ $3c(3d - cd + 4)$  |
| 4) $4ab + 2b - abc$ $b(4a + 2 - ac)$                  | 13) $7xyz + xy^2 - x^2y$ $xy(7z + y - x)$  |
| 5) $5suv - 10sv + 15su$ $5s(uv - 2v + 3u)$            | 14) $e^2f - 5e^3f^2 + e^2$ $e^2(f - 5ef^2 + 1)$  |
| 6) $16xy + 24y - 8xyz$ $8y(2x + 3 - xz)$              | 15) $8st^2u - 32s^2t + 64st$ $8st(tu - 4s + 8)$  |
| 7) $9wu - 27wuv + 45w$ $9w(u - 3uv + 5)$              | 16) $12g^3h - 9g^2h^2 + 18g^2h$ $3g^2h(4g - 3h + 6)$                                       |
| 8) $24gh - 12g + 15h$ $3(8gh - 4g + 5h)$              | 17) $\frac{1}{2}ab + \frac{3}{4}a^2 - a$ $\frac{1}{4}a(2b + 3a - 4)$                       |
| 9) $132pqr - 96qr + 108pqrs$<br>$12qr(11p - 8 + 9ps)$ | 18) $\frac{3}{4}x^4y - x^2y^3 + \frac{1}{2}x^3y^2$<br>$\frac{1}{4}x^2y(3x^2 - 4y^2 + 2xy)$ |

# Solving Linear Equations (A)



## ANSWERS

Solve the equations to find  $x$ .

### Section A

- |                      |                       |                       |                        |
|----------------------|-----------------------|-----------------------|------------------------|
| 1) $x+3=11$ <b>8</b> | 4) $x+7=13$ <b>6</b>  | 7) $x+3=9$ <b>6</b>   | 10) $x+5=36$ <b>31</b> |
| 2) $x+2=8$ <b>6</b>  | 5) $x+4=14$ <b>10</b> | 8) $x+12=17$ <b>5</b> | 11) $x+8=43$ <b>35</b> |
| 3) $x+5=7$ <b>2</b>  | 6) $x+7=9$ <b>2</b>   | 9) $x+6=24$ <b>18</b> | 12) $x+9=61$ <b>52</b> |

### Section B

- |                      |                       |                        |                         |
|----------------------|-----------------------|------------------------|-------------------------|
| 1) $4+x=6$ <b>2</b>  | 4) $5+x=9$ <b>4</b>   | 7) $14+x=23$ <b>9</b>  | 10) $8+x=72$ <b>64</b>  |
| 2) $2+x=7$ <b>5</b>  | 5) $7+x=12$ <b>5</b>  | 8) $19+x=32$ <b>13</b> | 11) $11+x=64$ <b>53</b> |
| 3) $8+x=11$ <b>3</b> | 6) $12+x=18$ <b>6</b> | 9) $7+x=40$ <b>33</b>  | 12) $28+x=90$ <b>62</b> |

### Section C

- |                      |                       |                       |                             |
|----------------------|-----------------------|-----------------------|-----------------------------|
| 1) $x-4=7$ <b>11</b> | 4) $x-7=13$ <b>20</b> | 7) $x-11=8$ <b>19</b> | 10) $x-12=31$ <b>43</b>     |
| 2) $x-6=4$ <b>10</b> | 5) $x-10=2$ <b>12</b> | 8) $x-5=16$ <b>21</b> | 11) $x-16=29$ <b>45</b>     |
| 3) $x-1=6$ <b>7</b>  | 6) $x-7=18$ <b>25</b> | 9) $x-9=25$ <b>34</b> | 12) $x-28=78$<br><b>106</b> |

### Section D

- |                     |                      |                      |                        |
|---------------------|----------------------|----------------------|------------------------|
| 1) $2x=6$ <b>3</b>  | 4) $10x=90$ <b>9</b> | 7) $7x=35$ <b>5</b>  | 10) $20x=40$ <b>2</b>  |
| 2) $5x=10$ <b>2</b> | 5) $3x=15$ <b>3</b>  | 8) $12x=36$ <b>3</b> | 11) $40x=120$ <b>3</b> |
| 3) $4x=12$ <b>3</b> | 6) $6x=24$ <b>4</b>  | 9) $15x=30$ <b>2</b> | 12) $50x=200$ <b>4</b> |

### Section E

- |                              |                              |                              |                                 |
|------------------------------|------------------------------|------------------------------|---------------------------------|
| 1) $\frac{x}{3}=4$ <b>12</b> | 4) $\frac{x}{8}=4$ <b>32</b> | 7) $\frac{x}{2}=9$ <b>18</b> | 10) $\frac{x}{12}=6$ <b>72</b>  |
| 2) $\frac{x}{2}=8$ <b>16</b> | 5) $\frac{x}{7}=3$ <b>21</b> | 8) $\frac{x}{9}=5$ <b>45</b> | 11) $\frac{x}{14}=2$ <b>28</b>  |
| 3) $\frac{x}{5}=7$ <b>35</b> | 6) $\frac{x}{5}=4$ <b>20</b> | 9) $\frac{x}{7}=8$ <b>56</b> | 12) $\frac{x}{30}=5$ <b>150</b> |

### Section F

- |                               |                                  |                                |                                  |
|-------------------------------|----------------------------------|--------------------------------|----------------------------------|
| 1) $4x=48$ <b>12</b>          | 7) $12x-19=30$ <b>49</b>         | 13) $7x=56$ <b>8</b>           | 17) $5x=100$ <b>20</b>           |
| 2) $x+13=22$ <b>9</b>         | 8) $10x=160$ <b>16</b>           | 14) $18+x=24$ <b>6</b>         | 18) $\frac{x}{3}=300$ <b>900</b> |
| 3) $9x=63$ <b>7</b>           | 9) $13+x=27$ <b>14</b>           | 15) $\frac{x}{4}=12$ <b>48</b> | 19) $x+49=110$ <b>61</b>         |
| 4) $11x=132$ <b>12</b>        | 10) $6x=42$ <b>7</b>             | 16) $25+x=39$ <b>14</b>        | 20) $100x=6500$<br><b>65</b>     |
| 5) $12+x=26$ <b>14</b>        | 11) $x+17=42$ <b>25</b>          |                                |                                  |
| 6) $\frac{x}{8}=12$ <b>96</b> | 12) $\frac{x}{11}=11$ <b>121</b> |                                |                                  |

# Solving Linear Equations (B)

## ANSWERS



Solve the equations to find  $x$ .

### Section A

- |                     |                     |                     |                            |
|---------------------|---------------------|---------------------|----------------------------|
| 1) $7x + 9 = 23$ 2  | 4) $9x + 5 = 41$ 4  | 7) $10x + 2 = 72$ 7 | 10) $4x + 7 = 9$ 0.5       |
| 2) $5x + 7 = 42$ 7  | 5) $4x + 2 = 34$ 8  | 8) $7x + 3 = 52$ 7  | 11) $8x + 11 = 15$ 0.5     |
| 3) $4x + 3 = 51$ 12 | 6) $11x + 3 = 36$ 3 | 9) $6x + 5 = 17$ 2  | 12) $4x + 17 = 18$<br>0.25 |

### Section B

- |                    |                      |                    |                        |
|--------------------|----------------------|--------------------|------------------------|
| 1) $1 + 6x = 19$ 3 | 4) $11 + 5x = 71$ 12 | 7) $23 = x + 8$ 15 | 10) $13 = 11 + 4x$ 0.5 |
| 2) $9 + 7x = 30$ 3 | 5) $5 + 3x = 32$ 9   | 8) $28 = 3x + 19$  | 11) $7 = 8x + 3$ 0.5   |
| 3) $3 + 2x = 17$ 7 | 6) $4 + 5x = 44$ 8   | 9) $53 = 8x + 5$ 6 | 12) $12 = 7 + 15x$ 1/3 |

### Section C

- |                     |                     |                     |                       |
|---------------------|---------------------|---------------------|-----------------------|
| 1) $4x - 1 = 31$ 8  | 4) $8x - 2 = 46$ 6  | 7) $9x - 4 = 32$ 4  | 10) $2x - 1 = 2$ 0.5  |
| 2) $3x - 4 = 29$ 11 | 5) $2x - 7 = 21$ 14 | 8) $5x - 1 = 64$ 13 | 11) $4x - 8 = 10$ 0.5 |
| 3) $6x - 5 = 31$ 6  | 6) $7x - 3 = 18$ 3  | 9) $12x - 9 = 39$ 4 | 12) $15x - 2 = 3$ 1/3 |

### Section D

- |                   |                      |                       |                       |
|-------------------|----------------------|-----------------------|-----------------------|
| 1) $x - 3 = -2$ 1 | 4) $x + 3 = 2$ -1    | 7) $2x - 3 = -9$ -3   | 10) $2x + 5 = 1$ -2   |
| 2) $x - 5 = -1$ 4 | 5) $x + 9 = 4$ -5    | 8) $2x - 10 = -2$ 4   | 11) $2x + 14 = 4$ -5  |
| 3) $x - 6 = -4$ 2 | 6) $x + 10 = -5$ -15 | 9) $2x - 18 = -20$ -1 | 12) $2x + 11 = -5$ -8 |

### Section E

- |                  |                     |                     |                       |
|------------------|---------------------|---------------------|-----------------------|
| 1) $5 - x = 2$ 3 | 4) $8 - x = 14$ -6  | 7) $3 - 2x = 5$ -1  | 10) $2 - 3x = 14$ -4  |
| 2) $9 - x = 5$ 4 | 5) $2 - x = 15$ -13 | 8) $5 - 2x = 15$ -5 | 11) $6 - 3x = 27$ -7  |
| 3) $6 - x = 3$ 3 | 6) $7 - x = 21$ -14 | 9) $8 - 2x = 12$ -2 | 12) $16 - 5x = 61$ -9 |

### Section F

- |                    |                       |                       |                           |
|--------------------|-----------------------|-----------------------|---------------------------|
| 1) $3x - 1 = 14$ 5 | 5) $1 - x = 6$ -5     | 9) $34 = -6 + 5x$ 8   | 13) $3 - 2x = 5$ -1       |
| 2) $x - 4 = -3$ 1  | 6) $8 + 5x = 63$ 11   | 10) $6 + 11x = -5$ -1 | 14) $8x + 42 = -54$ -12   |
| 3) $3 + 2x = 17$ 7 | 7) $16 - 2x = 40$ -12 | 11) $-29 = 3 + 4x$ -8 | 15) $6x - 16 = -70$ -9    |
| 4) $7x - 6 = 50$ 8 | 8) $34 = 6 - 4x$ -7   | 12) $6x + 13 = 25$ 2  | 16) $-9 - 4x = -53$<br>11 |



# Substituting into Expressions (A)



## ANSWERS

**Section A:** Substitute the value of  $a$  into the expressions. The first one has been done.

Expression	The value of $a$	Calculation	Answer
$2a$	$a = 3$	$2 \times 3$	<b>6</b>
$10a$	$a = 5$	$10 \times 5$	<b>50</b>
$7a$	$a = 11$	$7 \times 11$	<b>77</b>
$18 + a$	$a = 4$	$18 + 4$	<b>22</b>
$a + 14$	$a = 1$	$1 + 14$	<b>15</b>
$a - 11$	$a = 16$	$16 - 11$	<b>5</b>
$15 - a$	$a = 2$	$15 - 2$	<b>13</b>
$\frac{a}{4}$	$a = 12$	$12 \div 4$	<b>3</b>
$\frac{a}{8}$	$a = 56$	$56 \div 8$	<b>7</b>

**Section B:** Substitute the value of  $b$  into the expressions. The first one has been started.

Expression	The value of $b$	Do first	Do second	Answer
$2b - 1$	$b = 15$	$2 \times 15 = 30$	$30 - 1$	<b>29</b>
$20 - 4b$	$b = 1$	$4 \times 1 = 4$	$20 - 4$	<b>16</b>
$\frac{b}{2} + 7$	$b = 16$	$16 \div 2 = 8$	$8 + 7$	<b>15</b>
$100 - \frac{b}{5}$	$b = 25$	$25 \div 5 = 5$	$100 - 5$	<b>95</b>

**Section C:** Substitute the value of  $n$  into the expression.

Expression	The value of $n$	Answer
$9n + 11$	$n = 12$	<b>119</b>
$\frac{n + 12}{8}$	$n = 84$	<b>12</b>
$\frac{28 - 2n}{4}$	$n = 6$	<b>4</b>
$n^2$	$n = 7$	<b>49</b>

# Substituting into Expressions (B)

## ANSWERS



### Section A

Expression	The value of a	Do first	Do second	Answer
$8a - 9$	$a = 2$	$8 \times 2 = 16$	$16 - 9$	7
$4 + 2a$	$a = 6$	$2 \times 6 = 12$	$4 + 12$	16
$\frac{a}{5} + 20$	$a = 10$	$10 \div 5 = 2$	$2 + 20$	22
$11 - \frac{a}{3}$	$a = 12$	$12 \div 3 = 4$	$11 - 4$	7
$\frac{8a}{10}$	$a = 5$	$8 \times 5 = 40$	$40 \div 10$	4

### Section B

	The value of b	Do first	Do second	Do third	Answer
$\frac{14b + 13}{9}$	$b = 1$	$14 \times 1 = 14$	$14 + 13 = 27$	$27 \div 9$	3
$\frac{52 - 2b}{7}$	$b = 12$	$2 \times 12 = 24$	$52 - 24$	$28 \div 7$	4
$10b - b^2$	$b = 2$	$2^2 = 4$	$10 \times 2 = 20$	$20 - 4$	16
	The value of a and b	Do first	Do second	Do third	Answer
$7a + ab$	$a = 2$ $b = 3$	$7 \times 2 = 14$	$2 \times 3 = 6$	$14 + 6$	20
$9b - 6a$	$a = 5$ $b = 8$	$9 \times 8 = 72$	$6 \times 5 = 30$	$72 - 30$	42
$a^2 + b^2$	$a = 11$ $b = 4$	$a^2 = 121$	$b^2 = 16$	$121 + 16$	137
$1 + \frac{5a}{b}$	$a = 12$ $b = 6$	$5 \times 12 = 60$	$60 \div 6 = 10$	$1 + 10$	11
$\frac{84 - 6a}{b}$	$a = 10$ $b = 3$	$6 \times 10 = 60$	$84 - 60 = 24$	$24 \div 3$	8
$(a + b)^2 + 3$	$a = 2$ $b = 5$	$2 + 5 = 7$	$7^2 = 49$	$49 + 3$	52

### Section C

	The value of x and y	Answer
$\frac{33 - 3x}{2y}$	$x = 7$ $y = 3$	2
$xy - y^2$	$x = 10$ $y = 6$	24
$(xy - 3y)^2$	$x = 4$ $y = 8$	64