7(4x - y) = ___
# Algebra

## Student Book - Series H

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### Practice Tests

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Author of The Topics and Topic Tests: AS Kalra
Question 1  Write an expression for the following.

a  The sum of \( x \) and \( y \) = 

b  Five less than \( x \) = 

c  The double of \( a \) = 

d  The difference between \( a \) and \( b \) = 

e  Half of \( x \) = 

f  Seven times the number \( m \) = 

g  The sum of \( x \) and 21 = 

h  The sum of \( l \), 3\( m \) and 2\( n \) = 

Question 2  If \( x \) represents any number, write an algebraic expression for the following.

a  Three times the number = 

b  One third of the number = 

c  The sum of the number and 12 = 

d  Difference between the number and 7 = 

e  Two more than the number = 

f  Seven less than the number = 

Question 3  Write algebraic expressions to show the sum of the following.

a  8 and \( a \) = 

b  \( x \) and \( y \) = 

c  \( x \), \( y \) and \( z \) = 

d  2\( a \), 3\( b \) and 8\( c \) = 

e  2\( l \), 8\( m \) and 3\( n \) = 

f  5\( x \), 2\( y \) and 3\( z \) = 

Question 4  Write algebraic expressions for the following.

a  To the sum of 6\( x \) and 3\( y \), add 2\( n \). 

b  From the product of \( m \) and \( n \), take away 3. 

c  Divide \( x \) by \( y \) and then take 9 away. 

d  Divide the sum of \( p \) and \( q \) by 9. 

e  9 plus \( y \) all divided by 3. 

**Algebra**

**Topic 2: Simplifying algebraic expressions**

**QUESTION 1**  For each of the following terms, write down the coefficient of the pronumeral.

a. $8x$  
b. $7y$  
c. $11t$  
d. $32a$

e. $51b$  
f. $30y$  
g. $23c$  
h. $10l$

i. $15m$  
j. $46n$  
k. $13d$  
l. $37p$

**QUESTION 2**  List the like terms in the following.

a. $2b, 7a, 5a$  
b. $3x, 4y, 2x$  
c. $8x, 2a, 3x$

d. $5a, 2d, 3a$  
e. $6y, 5a, 2y$  
f. $2l, 3m, 5l$

g. $2d, 3c, 5c$  
h. $8, 5a, 3a$  
i. $9x, x, y$

**QUESTION 3**  Simplify the following.

a. $y + y = $  
b. $x + x + x + x = $  
c. $m + m + m + m + m = $

d. $a + a + a = $  
e. $l + l + l + l + l = $  
f. $n + n + n + n = $

g. $2d + 3d = $  
h. $5k + 2k + k = $  
i. $3a + 7a = $

**QUESTION 4**  Simplify the following expressions.

a. $18x - 3x = $  
b. $15b - 12b = $  
c. $24a - 12a = $

d. $17a - 7a = $  
e. $15x - 6x = $  
f. $12a - 3a = $

g. $9m - m = $  
h. $14p - 2p = $  
i. $10x - x = $

**QUESTION 5**  Simplify the following.

a. $5 \times d = $  
b. $6 \times a \times c = $  
c. $a \times b \times c = $

d. $8 \times x \times y = $  
e. $15 \times m \times l \times n = $  
f. $4 \times a \times c = $

g. $x \times y \times 7 = $  
h. $8 \times 2 \times a \times b = $  
i. $5 \times c \times d \times e = $

**QUESTION 6**  Write the following expressions in expanded form.

a. $3ab = $  
b. $5xyz = $  
c. $7mnt = $  
d. $6m = $

e. $8abc = $  
f. $9alm = $

g. $15xy = $  
h. $11de^2f = $
**Algebra**

**Topic 3: Collecting like terms**

**QUESTION 1** Collect like terms to simplify the following.

- **a** \( a + a + a + a + b + b = \) ________________
- **b** \( x + x + x + y + y + y = \) ________________
- **c** \( c + c + c + c + c + d = \) ________________
- **d** \( m + n + n + n = \) ________________
- **e** \( p + p + p + q + q + q = \) ________________
- **f** \( l + l + l + l + l + m + m = \) ________________
- **g** \( u + u + u + u + u + u + v = \) ________________
- **h** \( e + e + e + f + f = \) ________________

**QUESTION 2** Simplify the following by collecting like terms.

- **a** \( 4x + 9 + 2x + 7 = \) ________________
- **b** \( 8a + 9 + 7a + 3 = \) ________________
- **c** \( 5a + 3b + 4a = \) ________________
- **d** \( 5x + 2y + 2x = \) ________________
- **e** \( 7m + 8n + 9m = \) ________________
- **f** \( 2x + 3y + 5x + 8y = \) ________________
- **g** \( 5d + 3a + 9d + 5a = \) ________________
- **h** \( 8x + 15 + 6a + 6 = \) ________________

**QUESTION 3** Simplify the following.

- **a** \( 15a - 6a + 9a + b = \) ________________
- **b** \( 8x + 7y - 6x - 3y = \) ________________
- **c** \( 5m + 7n + 8m - 3n = \) ________________
- **d** \( 5p - 3p + 12q - 7q = \) ________________
- **e** \( 9x + 7y - 3x + 2y = \) ________________
- **f** \( 9p - 7p + 8q - 6q = \) ________________
- **g** \( 18x + 35x + 9 = \) ________________
- **h** \( 15abc - 12abc = \) ________________
- **i** \( 14l - 6l + 5m + 18m - 9m = \) ________________
- **j** \( 5x + 8y + 9x - 3y - 2y = \) ________________

**QUESTION 4** Simplify the following.

- **a** \( 27xy - 21xy = \) ________________
- **b** \( 18xyz - 12xyz = \) ________________
- **c** \( 18abc - 14abc = \) ________________
- **d** \( 21a + 3b + 41a = \) ________________
- **e** \( 8x^2y + 7x^2y - 2x^2y = \) ________________
- **f** \( 8a^3 + 7a^3 - 3a^3 = \) ________________
- **g** \( 5x^2 + 8x^2 - 2x^2 = \) ________________
- **h** \( 24a^2 + 18b^2 - 12a^2 = \) ________________
- **i** \( 7ab + 9ab + 8abc - 3abc = \) ________________
- **j** \( 5a^2b + 8l + 7a^2b - 3l = \) ________________
- **k** \( 6x^2y^2 + 8y + 4x^2y^2 + 3y = \) ________________
- **l** \( 9a^2b^2 + 6a^2b^2 - 7a^2b^2 + 8ab = \) ________________
- **m** \( 16ab^2 + 8a^2b - 12ab^2 = \) ________________
- **n** \( 15xyz + 4y + 3xyz - 3y = \) ________________
**Algebra**

**Topic 4: Algebraic abbreviations**

**QUESTION 1**

a Write $8 \times m$ in a shorter way. ____________________________

b Write $2 \times 3 \times n$ in a shorter way. ____________________________

c Write $6 \times x \times x$ in another way. ____________________________

d Write $6xy$ showing multiplication signs. ____________________________

e What is the difference between $24m$ and $2 \times 4 \times m$? ____________________________

**QUESTION 2** Write the following expressions without multiplication or division signs.

a $\cdot 6 \times 3 \times k =$ __________  
b $\cdot 4 \times m \times 2 =$ __________  
c $x + 3 \times y =$ __________

d $\cdot 5 \times (a + 2) =$ __________  
e $\cdot n + 3 =$ __________  
f $\cdot x \times y \times z =$ __________

g $\cdot 2 \times b \times 3 =$ __________  
h $\cdot p \times q \times 9 =$ __________  
i $\cdot 3 \times a \times 7 \times b =$ __________

j $\cdot 2 \times n \times 5 =$ __________  
k $\cdot 3 + 8 \times a =$ __________  
l $\cdot 3 \times x + 4 \times y =$ __________

m $\cdot 9 + a =$ __________  
n $\cdot 2x + 9 =$ __________  
o $\cdot k + 12 =$ __________

p $\cdot (p + q) + 7 =$ __________  
q $\cdot 8a + (a + 2) =$ __________  
r $\cdot (4a + 8) + 3a =$ __________

**QUESTION 3** Write the following expressions by showing all multiplication or division signs.

a $\cdot 3m =$ __________  
b $\cdot 2x =$ __________  
c $\cdot 7y =$ __________

d $\cdot 3n - 1 =$ __________  
e $\cdot 4m + 5 =$ __________  
f $\cdot 20 - 3a =$ __________

g $\cdot xy - 6 =$ __________  
h $\cdot k - 4l =$ __________  
i $\cdot xyz =$ __________

j $\cdot 19xy =$ __________  
k $\cdot 6a^2 + 1 =$ __________  
l $\cdot m^2 - n^2 =$ __________

**QUESTION 4** Write the following in a shortened form.

a $\cdot 3 \times (x + 2) =$ __________  
b $\cdot 5 \times (m - 8) =$ __________

c $\cdot 8 \times p \times (q + 2) =$ __________  
d $\cdot 2 \times 3 \times (a - 5) =$ __________

e $\cdot a \times b \times (c + 4) =$ __________  
f $\cdot 4 \times (5a - 1) =$ __________

g $\cdot 7 \times (4 + 3 \times x) =$ __________  
h $\cdot 5 \times (3 \times y - 2 \times z)$ __________

i $\cdot (n + 2) \times (n + 3) =$ __________  
j $\cdot (4p + 1) \times (4q - 3) =$ __________

k $\cdot a \times 3 \times a \times a =$ __________  
l $\cdot y \times y \times y \times a \times a =$ __________
**Algebra**

**Topic 5: Substitution**

**QUESTION 1** If \( a = 3 \), find the value of the following expressions.

\[
\begin{align*}
\text{a} & \quad 5a = \quad \underline{15} \\
\text{b} & \quad 8a + 1 = \quad \underline{25} \\
\text{c} & \quad 4a - 1 = \quad \underline{11}
\end{align*}
\]

\[
\begin{align*}
\text{d} & \quad a^2 = \quad \underline{9} \\
\text{e} & \quad 3a^2 = \quad \underline{27} \\
\text{f} & \quad (a + 1)(a - 1) = \quad \underline{8}
\end{align*}
\]

\[
\begin{align*}
\text{g} & \quad 8a - 10 = \quad \underline{10} \\
\text{h} & \quad a^2 - a = \quad \underline{6} \\
\text{i} & \quad a + 6 = \quad \underline{9}
\end{align*}
\]

\[
\begin{align*}
\text{j} & \quad 9a + 3 = \quad \underline{30} \\
\text{k} & \quad 27 + a = \quad \underline{30} \\
\text{l} & \quad (a - 2) + 9 = \quad \underline{11}
\end{align*}
\]

**QUESTION 2** If \( a = 2, \ b = 5, \ c = 7 \) and \( d = 9 \), find the value of

\[
\begin{align*}
\text{a} & \quad a + b = \quad \underline{7} \\
\text{b} & \quad c + d = \quad \underline{16} \\
\text{c} & \quad ab + cd = \quad \underline{138}
\end{align*}
\]

\[
\begin{align*}
\text{d} & \quad abc = \quad \underline{140} \\
\text{e} & \quad 2a + 3b = \quad \underline{17} \\
\text{f} & \quad 2b + 5c = \quad \underline{59}
\end{align*}
\]

\[
\begin{align*}
\text{g} & \quad 9ab = \quad \underline{126} \\
\text{h} & \quad 7b - c = \quad \underline{10} \\
\text{i} & \quad 8b + a = \quad \underline{18}
\end{align*}
\]

\[
\begin{align*}
\text{j} & \quad 3a - a^2 = \quad \underline{1} \\
\text{k} & \quad a + b + c = \quad \underline{14} \\
\text{l} & \quad 8c - a = \quad \underline{50}
\end{align*}
\]

**QUESTION 3** Complete the following.

\[
\begin{array}{|c|c|c|c|c|c|}
\hline
\text{a} & \quad 1 & 2 & 3 & 4 & 5 \\
\hline
\text{b} & \quad & & & & \\
\hline
\text{c} & \quad \frac{m = 12 - l}{0} & 1 & 5 & 7 & \\
\hline
\end{array}
\]

\[
\begin{array}{|c|c|c|c|c|c|}
\hline
\text{d} & \quad \frac{\text{y} = 3x - 1}{1} & 2 & 3 & 4 & 5 & 6 \\
\hline
\text{e} & \quad \frac{q = 4p + 3}{p} & 0 & 1 & 2 & 3 & 4 \\
\hline
\text{f} & \quad \frac{v = 20 - 3u}{u} & 1 & 2 & 3 & 4 & 5 & 6 \\
\hline
\end{array}
\]

**QUESTION 4** Complete the following table.

<table>
<thead>
<tr>
<th></th>
<th>( m )</th>
<th>( n )</th>
<th>( m + n )</th>
<th>( m - n )</th>
<th>( mn )</th>
<th>( m^2 )</th>
<th>( n^2 )</th>
<th>( 3m + 2n )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( a )</td>
<td>4</td>
<td>2</td>
<td>6</td>
<td>2</td>
<td>8</td>
<td>16</td>
<td>16</td>
<td>18</td>
</tr>
<tr>
<td>( b )</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>9</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td>( c )</td>
<td>7</td>
<td>2</td>
<td>9</td>
<td>5</td>
<td>14</td>
<td>49</td>
<td>4</td>
<td>23</td>
</tr>
<tr>
<td>( d )</td>
<td>6</td>
<td>1</td>
<td>7</td>
<td>5</td>
<td>6</td>
<td>36</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>( e )</td>
<td>9</td>
<td>3</td>
<td>12</td>
<td>6</td>
<td>27</td>
<td>81</td>
<td>9</td>
<td>33</td>
</tr>
<tr>
<td>( f )</td>
<td>8</td>
<td>7</td>
<td>15</td>
<td>1</td>
<td>56</td>
<td>64</td>
<td>49</td>
<td>57</td>
</tr>
</tbody>
</table>
Algebra

Topic 6: Index notation

**QUESTION 1** Write each of the following in simplest index notation.

a \( m \times m \times m = \) ______

b \( a \times a \times a \times a \times a \times a = \) ______

c \( l \times l \times l \times l = \) ______

d \( x \times x \times x \times x \times x \times x = \) ______

e \( p \times p = \) ______

f \( q \times q \times q \times q \times q = \) ______

**QUESTION 2** Write each of the following in the expanded form.

a \( b^2 = \) ______

b \( x^5 = \) ______

c \( a^4 = \) ______

d \( m^7 = \) ______

e \( e^3 = \) ______

f \( f^8 = \) ______

**QUESTION 3** Find the value of each of the following when \( x = 2 \)

a \( x^2 = \) ______

b \( x^5 = \) ______

\( x^4 = \) ______

d \( x^3 = \) ______

\( x^7 = \) ______

f \( 3x = \) ______

**QUESTION 4** Write each of the following in simplest index notation.

a \( 3 \times a \times a \times a = \) ______

b \( 4 \times y \times y \times 2 = \) ______

c \( x \times x \times 6 \times x 	imes x = \) ______

\( p \times p \times 2 \times p \times p = \) ______

e \( h \times h \times 9 \times h = \) ______

f \( 3 \times m \times m \times 3 \times m \times m = \) ______

**QUESTION 5** Expand each of the following.

a \( 5 \times x^2 = \) ______

b \( 8a^3 = \) ______

c \( 7 \times y^4 = \) ______

\( 6m^4 = \) ______

e \( 11 \times x^3 = \) ______

f \( 9y^2 = \) ______

**QUESTION 6** Find the value of each of the following when \( a = 2 \) and \( b = 3 \)

a \( a^2 = \) ______

b \( a^3b = \) ______

c \( a^2 + ab = \) ______

\( a^3 + b^2 = \) ______

e \( 4a^2 + 3b^2 = \) ______

f \( 9b^3 = \) ______

g \( b^2 - a^2 = \) ______

h \( 8a^2b = \) ______
**Question 1** Simplify the following, writing your answer in index form.

a. \( x^6 \times x^2 = \)  

b. \( y^3 \times y^2 = \)  

c. \( a^3 \times a^4 = \)  

d. \( m^3 \times m^5 = \)  

e. \( p^2 \times p^7 = \)  

f. \( n^9 \times n^2 = \)  

g. \( a^2 \times a^3 \times a^5 = \)  

h. \( x^4 \times x^2 \times x = \)  

i. \( y^3 \times y^9 = \)  

**Question 2** Simplify the following.

a. \( x^7 + x^3 = \)  

b. \( x^9 + x^3 = \)  

\( x^5 + x = \)  

d. \( y^6 + y^4 = \)  

\( y^9 + y^7 = \)  

\( a^8 + a^3 = \)  

g. \( m^{20} + m^{11} = \)  

\( m^9 + m^8 = \)  

\( m^{14} + m^{10} = \)  

**Question 3** Simplify the following.

a. \( (a^2)^3 = \)  

b. \( (b^3)^4 = \)  

\( (a^4)^5 = \)  

d. \( (x^3)^6 = \)  

\( (x^2)^7 = \)  

\( (x^5)^2 = \)  

g. \( (5x^2)^2 = \)  

\( (2x^3)^3 = \)  

\( (3b^5)^2 = \)  

**Question 4** Simplify the following.

a. \( 3x^5 \times x^4 = \)  

b. \( 4x^9 \times x^2 = \)  

\( a^9 \times 3a^4 = \)  

d. \( m^5 \times 6m^2 = \)  

\( 8k^2 \times 6k^3 = \)  

\( 3m^5 \times 7m^6 = \)  

g. \( m^3 n^2 \times m^4 n^5 = \)  

\( x^2 y^3 \times x^4 y^7 = \)  

\( x y \times x^3 y^2 = \)  

j. \( 24x^7 y^6 + 8x^5 = \)  

k. \( 12m^4 n^3 + 6m^2 n^2 = \)  

\( 32x^7 y^5 + 16x^2 y^2 = \)  

**Question 5** Simplify the following.

a. \( (a^2 b^3)^2 = \)  

b. \( (x^5 y)^3 = \)  

\( (m^7 n^2)^3 = \)  

d. \( x^5 \times x^6 + x^3 = \)  

\( x^6 + x^3 + x^2 = \)  

\( a^4 \times a^5 + a^7 = \)  

g. \( a^7 \times a^7 = \)  

\( a^{10} \times a^5 \)  

\( a^8 = \)  

i. \( b^9 \times b^9 \)  

\( b^8 = \)  

**Question 6** Simplify the following.

a. \( x^9 + x^7 = \)  

b. \( x^7 + x^3 = \)  

\( x^{17} + x^{13} = \)  

d. \( x^4 \times x^2 + x^3 = \)  

\( x^5 \times x^4 + x^7 = \)  

\( x^8 \times x^3 + x^9 = \)  

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Algebra

Topic 8: Grouping symbols

**Question 1** Expand the following expressions.

a. \((3a + 2b) = \) _______
b. \((5a + b) = \) _______
c. \((2a + b) = \) _______
d. \((7m + 2n) = \) _______
e. \((8m - n) = \) _______
f. \((4x + 8y) = \) _______
g. \((5x + 2y) = \) _______
h. \((6a - 2b) = \) _______
i. \((3a - b) = \) _______

**Question 2** Expand.

a. \((2a + 9) = \) _______
b. \((4x - y) = \) _______
c. \((2x - 8y) = \) _______
d. \((y + 3) = \) _______
e. \((x + 4) = \) _______
f. \((a + b) = \) _______
g. \((k - 3) = \) _______
h. \((4l - 5) = \) _______
i. \((2p - 6) = \) _______

**Question 3** Remove the grouping symbols.

a. \((2a + 3) = \) _______
b. \((3m - 7) = \) _______
c. \((p + 8) = \) _______
d. \((2x + 7) = \) _______
e. \((8y + 2y) = \) _______
f. \((7p + 3p - 1) = \) _______
g. \((3m - 9) = \) _______
h. \((2x + 5) = \) _______
i. \((5a - 11) = \) _______

**Question 4** Expand.

a. \((3y + 5) = \) _______
b. \((8a - 3b) = \) _______
c. \((9x - y) = \) _______
d. \((8y - 7) = \) _______
e. \((5a - 2b) = \) _______
f. \((2a + b) = \) _______
g. \((3x - 2y) = \) _______
h. \((3p - 6) = \) _______
i. \((7a + 3b) = \) _______

**Question 5** Expand the following expressions.

a. \((y^2 - 4) = \) _______
b. \((x^3 - 7) = \) _______
c. \((a^3 - 6) = \) _______
d. \((8x + 3y) = \) _______
e. \((2m + 7n) = \) _______
f. \((5p - 6) = \) _______
g. \((6x - 7y) = \) _______
h. \((5p + 3) = \) _______
i. \((8a - 7b) = \) _______

**Question 6** Expand.

a. \((9x - 7y) = \) _______
b. \((3m - 7n) = \) _______
c. \((6p - 7q) = \) _______
d. \((x^3 - 5) = \) _______
e. \((6p^2 + 7) = \) _______
f. \((5a^4 - 3) = \) _______
g. \((a^4 - a) = \) _______
h. \((9mn + 2) = \) _______
i. \((6a^3 + y) = \) _______
Topic 9: Equations — choosing the correct solution

**Question 1** By substituting back into equation, see if the given value of the pronumeral is correct or incorrect.

<p>| | | | | |</p>
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<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>a</td>
<td>(x + 5 = 15)</td>
<td>(x = 10)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b</td>
<td>(y + 3 = 16)</td>
<td>(y = 12)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c</td>
<td>(x - 6 = 13)</td>
<td>(x = 19)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d</td>
<td>(a - 8 = 10)</td>
<td>(a = 2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e</td>
<td>(x + 9 = 23)</td>
<td>(x = 8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>f</td>
<td>(b - 5 = 17)</td>
<td>(b = 22)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>g</td>
<td>(x + 8 = 17)</td>
<td>(x = 7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>h</td>
<td>(n - 2 = 6)</td>
<td>(n = 8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i</td>
<td>(x - 3 = 16)</td>
<td>(x = 19)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>j</td>
<td>(m + 5 = 21)</td>
<td>(m = 16)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>k</td>
<td>(x - 7 = 19)</td>
<td>(x = 26)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>l</td>
<td>(n - 3 = 9)</td>
<td>(n = 12)</td>
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</table>

**Question 2** Fill in only ONE CIRCLE for the correct solution in each question.

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<tr>
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</thead>
<tbody>
<tr>
<td>a</td>
<td>(x + 5 = 17)</td>
<td>(x = 12)</td>
<td>(x = 5)</td>
<td>(x = 23)</td>
</tr>
<tr>
<td>b</td>
<td>(y - 6 = 23)</td>
<td>(y = 17)</td>
<td>(y = 18)</td>
<td>(y = 28)</td>
</tr>
<tr>
<td>c</td>
<td>(m - 8 = 16)</td>
<td>(m = 24)</td>
<td>(m = 16)</td>
<td>(m = 8)</td>
</tr>
<tr>
<td>d</td>
<td>(a + 3 = 18)</td>
<td>(a = 24)</td>
<td>(a = 25)</td>
<td>(a = 15)</td>
</tr>
<tr>
<td>e</td>
<td>(n - 16 = 32)</td>
<td>(n = 48)</td>
<td>(n = 16)</td>
<td>(n = 32)</td>
</tr>
</tbody>
</table>

**Question 3** Is the value shown in brackets the solution of the equation? Answer YES or NO.

<p>| | | | | |</p>
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>(9 + x = 28)</td>
<td>(x = 16)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b</td>
<td>(d - 7 = 16)</td>
<td>(d = \frac{23}{2})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c</td>
<td>(6 + y = 24)</td>
<td>(y = 18)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d</td>
<td>(3y = 36)</td>
<td>(y = 12)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e</td>
<td>(9 - m = 14)</td>
<td>(m = -5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>f</td>
<td>(5x = 15)</td>
<td>(x = 3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>g</td>
<td>(n - 10 = 12)</td>
<td>(n = 2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>h</td>
<td>(x \div 3 = 8)</td>
<td>(x = 24)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Question 4** Fill in only ONE CIRCLE for the correct solution in each question.

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>(3x = 15)</td>
<td>(x = 3)</td>
<td>(x = 15)</td>
<td>(x = 5)</td>
</tr>
<tr>
<td>b</td>
<td>(x = 18)</td>
<td>(x = 36)</td>
<td>(x = 9)</td>
<td>(x = 20)</td>
</tr>
<tr>
<td>c</td>
<td>(7y = 21)</td>
<td>(y = 28)</td>
<td>(y = 3)</td>
<td>(y = 14)</td>
</tr>
</tbody>
</table>
Algebra

Topic 10: One-step equations — addition and subtraction

**QUESTION 1** Solve the following one-step equations.

a \( x + 9 = 14 \)

b \( a + 6 = 35 \)

c \( m - 6 = 5 \)

d \( m + 8 = 34 \)

e \( x + 4 = 14 \)

f \( n - 7 = 12 \)

g \( p - 3 = 16 \)

h \( m + 5 = 19 \)

i \( y + 8 = 22 \)

j \( y - 5 = 12 \)

k \( t - 6 = 2 \)

l \( a - 7 = 16 \)

m \( x - 7 = 28 \)

n \( y - 7 = 4 \)

o \( 8 + x = 24 \)

**QUESTION 2** Solve the following equations.

a \( a + 16 = 34 \)

b \( y + 7 = 13 \)

c \( 6 + y = 18 \)

d \( 15 + n = 16 \)

e \( x - 20 = 32 \)

f \( x - 2 = 14 \)

g \( x + 12 = 38 \)

h \( y - 5 = 29 \)

i \( a + 7 = 15 \)

j \( m - 6 = 15 \)

k \( m - 10 = 39 \)

l \( x - 71 = 89 \)

m \( y - 6 = 9 \)

n \( t - 7 = 16 \)

o \( 12 + a = 16 \)
Algebra

Topic 11: One-step equations — multiplication and division

**QUESTION 1** Solve the following one-step equations.

<table>
<thead>
<tr>
<th></th>
<th>Equation</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>$4x = 32$</td>
<td>$x = 8$</td>
</tr>
<tr>
<td>b</td>
<td>$\frac{a}{7} = 8$</td>
<td>$a = 56$</td>
</tr>
<tr>
<td>c</td>
<td>$6y = 24$</td>
<td>$y = 4$</td>
</tr>
<tr>
<td>d</td>
<td>$\frac{y}{5} = 8$</td>
<td>$y = 40$</td>
</tr>
<tr>
<td>e</td>
<td>$\frac{m}{6} = 11$</td>
<td>$m = 66$</td>
</tr>
<tr>
<td>f</td>
<td>$\frac{x}{3} = 15$</td>
<td>$x = 45$</td>
</tr>
<tr>
<td>g</td>
<td>$9y = 81$</td>
<td>$y = 9$</td>
</tr>
<tr>
<td>h</td>
<td>$\frac{b}{6} = 12$</td>
<td>$b = 72$</td>
</tr>
<tr>
<td>i</td>
<td>$\frac{m}{8} = 12$</td>
<td>$m = 96$</td>
</tr>
<tr>
<td>j</td>
<td>$\frac{x}{9} = 6$</td>
<td>$x = 54$</td>
</tr>
<tr>
<td>k</td>
<td>$3p = 15$</td>
<td>$p = 5$</td>
</tr>
<tr>
<td>l</td>
<td>$8x = 72$</td>
<td>$x = 9$</td>
</tr>
<tr>
<td>m</td>
<td>$8x = 48$</td>
<td>$x = 6$</td>
</tr>
<tr>
<td>n</td>
<td>$\frac{n}{5} = 9$</td>
<td>$n = 45$</td>
</tr>
<tr>
<td>o</td>
<td>$12x = 96$</td>
<td>$x = 8$</td>
</tr>
</tbody>
</table>

**QUESTION 2** Solve the following equations.

<table>
<thead>
<tr>
<th></th>
<th>Equation</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>$\frac{x}{3} = 8$</td>
<td>$x = 24$</td>
</tr>
<tr>
<td>b</td>
<td>$2a = 14$</td>
<td>$a = 7$</td>
</tr>
<tr>
<td>c</td>
<td>$\frac{x}{9} = 7$</td>
<td>$x = 63$</td>
</tr>
<tr>
<td>d</td>
<td>$\frac{a}{5} = 25$</td>
<td>$a = 125$</td>
</tr>
<tr>
<td>e</td>
<td>$3x = 27$</td>
<td>$x = 9$</td>
</tr>
<tr>
<td>f</td>
<td>$\frac{m}{8} = 10$</td>
<td>$m = 80$</td>
</tr>
<tr>
<td>g</td>
<td>$\frac{m}{3} = 16$</td>
<td>$m = 48$</td>
</tr>
<tr>
<td>h</td>
<td>$\frac{x}{5} = 10$</td>
<td>$x = 50$</td>
</tr>
<tr>
<td>i</td>
<td>$4x = 52$</td>
<td>$x = 13$</td>
</tr>
<tr>
<td>j</td>
<td>$4a = 36$</td>
<td>$a = 9$</td>
</tr>
<tr>
<td>k</td>
<td>$\frac{y}{2} = 16$</td>
<td>$y = 32$</td>
</tr>
<tr>
<td>l</td>
<td>$6x = 84$</td>
<td>$x = 14$</td>
</tr>
<tr>
<td>m</td>
<td>$5x = 75$</td>
<td>$x = 15$</td>
</tr>
<tr>
<td>n</td>
<td>$7n = 28$</td>
<td>$n = 4$</td>
</tr>
<tr>
<td>o</td>
<td>$9x = 63$</td>
<td>$x = 7$</td>
</tr>
</tbody>
</table>
Question 1  Solve the following equations.

a. \[2x + 3x = 15\]

b. \[8m - 3m = 25\]

c. \[8y - y = 21\]

d. \[9a - 3a = 42\]

e. \[7p - 3p = 20\]

f. \[6x - 4x = 18\]

g. \[6y - 4y = 10\]

h. \[10n - 3n = 28\]

i. \[9m - 5m = 24\]

j. \[8x + x = 63\]

k. \[6y + 2y = 24\]

l. \[6a - a = 25\]

m. \[9y - 2y = 77\]

n. \[7x + 2x = 63\]

o. \[9a - 7a = 14\]

Question 2  Solve the following equations.

a. \[8x + 5x = 39\]

b. \[8p - 3p = 55\]

c. \[6x + 3x = 81\]

d. \[6m + 2m = 24\]

e. \[9d - d = 40\]

f. \[5a - a = 16\]

g. \[y + y = 12\]

h. \[7a - a = 54\]

i. \[5m + 15m = 40\]

j. \[3x + 2x = 25\]

k. \[8x - 6x = 12\]

l. \[8y - y = 63\]

m. \[9a - 7a = 28\]

n. \[9a - 8a = 10\]

o. \[9x - 2x = 70\]
Topic 13: Problem solving with equations

In the following questions, write an equation using the pronumeral \( x \) for the unknown number, and then find the value of \( x \).

1. The sum of a number and 7 is 21.

2. The sum of 5 and \( x \) is 14.

3. I think of a number and add 8. The result is 20.

4. A number increased by 6 is 15.

5. The difference between a number and 3 is 8.

6. I think of a number, double it and the result is 24.

7. The product of 3 and \( x \) is 21.

8. The product of 8 and \( x \) is 32.

9. \( x \) divided by 3 equals 5.

In the following questions write an equation and solve.

10. 6 less than \( x \) equals 9.

11. The sum of 6 and \( x \) is 32.

12. The product of 9 and \( x \) is 54.

13. \( x \) divided by 10 equals 7.

14. The sum of 2\( x \) and 3\( x \) is 15.

15. The difference between 8\( x \) and 6\( x \) is 16.
Algebra

Topic 14: Problem solving with algebra

1. Find an expression for the perimeter of a square with side length of $x$ units.

2. If a bag contains $m$ number of marbles, how many marbles are in five similar bags?

3. A fence is $x$ metres long. A further $y$ metres is added. How long is the fence now?

4. The sum of a number and 9 is 15. What is the number?

5. Michael has $x$ and gets $8y$ from the bank. How much does he have now?

6. The product of a number and 7 is 56. What is the number?

7. If a number is multiplied by 6, and 3 is added to the product, the result is 45. What is the number?

8. Is 8 is subtracted from a number, the result is 12. What is the number?

9. The sum of a number and 7 is 21. What is the number?

10. If a number is divided by 9, the result is 8. What is the number?

11. If 7 is subtracted from the product of 3 and a number, the result is 23. What is the number?

12. A photograph is $x$ cm long and $y$ cm wide. Find its area.

13. A room is measured $2a$ metres long and $3b$ metres wide. Find the difference between its length and width in metres.

14. I walked $3x$ km in the morning and $4y$ km in the evening. How many kilometres did I walk altogether?

15. Find the perimeter of a rectangular block of land $3p$ metres long and $4q$ metres wide.
# Algebra

## Unit Test

**PART A**

### Instructions

This part consists of 12 multiple-choice questions.

Each question is worth 1 mark.

Fill in only ONE CIRCLE for each question.

Calculators are NOT allowed.

**Time allowed: 15 minutes**  
**Total marks = 12**

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</thead>
<tbody>
<tr>
<td>1</td>
<td>$a + a + a$ equals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A $a^3$</td>
<td>B $3a^2$</td>
<td>C $3a$</td>
<td>D $3a^3$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>$2x + 3x$ equals</td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>A $5x^2$</td>
<td>B $6x^2$</td>
<td>C $6x$</td>
<td>D $5x$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>$6x - 2x$ equals</td>
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</tr>
<tr>
<td></td>
<td>A $4x$</td>
<td>B $4x^2$</td>
<td>C $4x^2$</td>
<td>D $4x$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>$5x \times c \times c$ equals</td>
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<tr>
<td></td>
<td>A $5ac$</td>
<td>B $5a^2c$</td>
<td>C $5ac^2$</td>
<td>D $5ac^3$</td>
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</tr>
<tr>
<td>5</td>
<td>$a + a + b + b + b$ equals</td>
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<tr>
<td></td>
<td>A $a^3 + b^2$</td>
<td>B $3a + 2b$</td>
<td>C $3a^3 + 2b^2$</td>
<td>D $a^2 + ab + b$</td>
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</tr>
<tr>
<td>6</td>
<td>5 less than $x$ is</td>
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<tr>
<td></td>
<td>A $x - 5$</td>
<td>B $5 - x$</td>
<td>C $5x - 1$</td>
<td>D $5x + 1$</td>
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<tr>
<td>7</td>
<td>$3x + 4xy$ equals</td>
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</tr>
<tr>
<td></td>
<td>A $x^2 + y^4$</td>
<td>B $12xy$</td>
<td>C $3x + 4y$</td>
<td>D $7xy$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>If $a = 2$ and $b = 3$ then $2a + 3b$ equals</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>A 12</td>
<td>B 13</td>
<td>C 25</td>
<td>D 36</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>If $x = 3$ then $3x - x^2$ equals</td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>A 9</td>
<td>B 0</td>
<td>C 27</td>
<td>D 1</td>
<td></td>
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</tr>
<tr>
<td>10</td>
<td>When $2x$ is added to the sum of $3x$ and $5y$ then the result is</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>A $6x^2 + 5y$</td>
<td>B $3x + 10y$</td>
<td>C $30x^2y$</td>
<td>D $5x + 5y$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>If $3y = 15$ then $y$ equals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A 3</td>
<td>B 5</td>
<td>C 15</td>
<td>D 45</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>$a^4 \times a^7$ equals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A $a^{28}$</td>
<td>B $a^{47}$</td>
<td>C $a^{11}$</td>
<td>D $a^3$</td>
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</tbody>
</table>

**Total marks achieved for PART A**  
12
Algebra

Unit Test

PART B

Instructions
This part consists of 15 questions
Each question is worth 1 mark
Write answers in the answers-only column

Time allowed: 20 minutes
Total marks = 15

<table>
<thead>
<tr>
<th>Questions</th>
<th>Answers only</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Simplify ( 2x + a \times 7 \times b )</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>2  Simplify ( 5x + 3y - 2x - y )</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>3  Write in a shorter way ( 5 \times 6(3x - 2) )</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>4  If ( a = 5 ) find ( 2a^2 )</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>5  If ( x = 3 ) and ( y = 5 ) find ( 2x + 3y )</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>6  Find the sum of ( 2x, 3y ) and 8.</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>7  To the sum of ( 5x ) and ( y ) add ( 3y )</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>8  Divide ( 2a ) by ( b ) and then add 7 to it.</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>9  Write in a shorter way ( 11 + x ), all divided by 5.</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>10 What is the difference between ( a ) and ( b ), divided by the sum of ( a ) and ( b )?</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>11 What is the product of 4, ( p ) and 3?</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>12 What is ( 2m ) subtracted from the product of ( m ) and ( n )?</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>13 Simplify ( 5x^3 \times 4x^2 )</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>14 Simplify ( \frac{a^5 \times a^3}{a^2} )</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>15 Expand ( 5(3x + 7) )</td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

Total marks achieved for PART B

\[ \boxed{15} \]