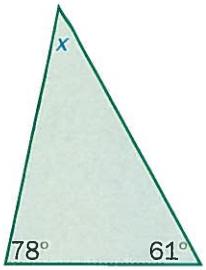
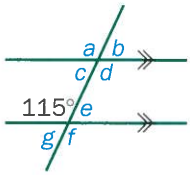
$$x + y + z = 180°$$
$$54° + y + 73° = 180°$$
$$y + 127° = 180°$$
$$y = 180° - 127°$$
$$y = 53°$$

1. Find the missing angle measures.

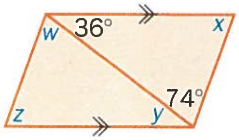
a)



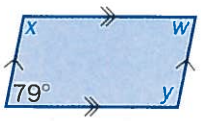
b)



c)



d)



Common factoring

To factor the expression $10y^2 + 8y$, determine the greatest common factor of both terms. Refer to greatest common factors in this appendix.

$10y^2 = 2 \times 5 \times y \times y$

$8y = 2 \times 2 \times 2 \times y$

The greatest common factor is $2y$.

The second factor is $\frac{10y^2}{2y} + \frac{8y}{2y}$ or $5y + 4$.

The factors of $10y^2 + 8y$ are $2y$ and $5y + 4$.
Therefore, $10y^2 + 8y = 2y(5y + 4)$.

1. State the missing factor.

a) $6x + 8y = 2(\square)$ **b)** $2x^2 - 5x = x(\square)$ **c)** $4abc + 10ab = 2ab(\square)$

d) $8a^3 - 12a^2 = 4a^2(\square)$ **e)** $-5ab - 10c = -5(\square)$ **f)** $-4x^2 + 8x = -4x(\square)$

2. Factor.

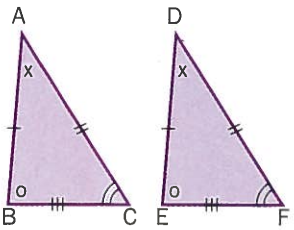
a) $5y + 15$ **b)** $24x - 16$ **c)** $4ab + 6a$ **d)** $3x^2 - 18x$

e) $2x^2 + 4x - 6$ **f)** $6x^3 - 3x^2 + 9x$ **g)** $8ab^2 + 4ab + 12a^2b$ **h)** $10y^3 - 10$

Congruent triangles

Congruent triangles have the same shape and the same size. When two triangles are congruent, their corresponding angles and corresponding sides are equal.
$\triangle ABC$ is congruent to $\triangle DEF$.
The following corresponding parts are equal.

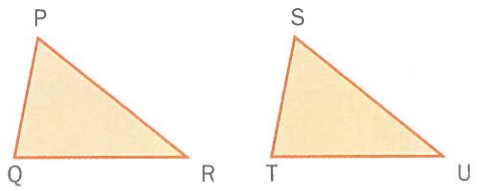
$\angle A = \angle D$ $\quad AB = DE$
$\angle B = \angle E$ $\quad AC = DF$
$\angle C = \angle F$ $\quad BC = EF$



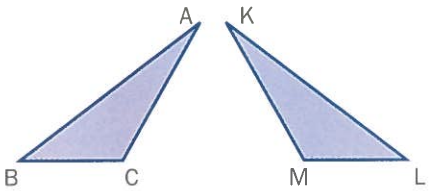
$\triangle ABC \cong \triangle DEF$

1. List the corresponding equal parts in each pair of congruent scalene triangles.

a)



b)



Evaluating expressions

To evaluate the expression $4x^2 - 5y$ for $x = 2$ and $y = -3$, substitute 2 for x and -3 for y in the expression. Then simplify using the order of operations.

$$\begin{aligned} 4x^2 - 3y &= 4(2)^2 - 5(-3) \\ &= 4(4) - 5(-3) \\ &= 16 + 15 \\ &= 31 \end{aligned}$$

1. Evaluate for $x = 3$, $y = 2$, and $z = 1$.

a) $3x + 4$ **b)** $2x + 4y - 3z$ **c)** $3(x + z)$ **d)** $x^2 - y^2 + z^2$

e) $3xy - yz + 2$ **f)** $2y^2 + x$ **g)** $3(4z + 3y)$ **h)** $2z(x - 2y)$

i) $3y^2 - 2x^2 + 3z^2$ **j)** $x(z - 4y)$ **k)** $(yz)^2$ **l)** $4(x - y - z)$

2. Evaluate for $x = -2$, $y = 3$, and $z = -1$.

a) $x + y - z$ **b)** $4x + 3y$ **c)** $5x + 3z - 4y$ **d)** $3xyz - 6$

e) $4yz - x$ **f)** $xy + yz - xz$ **g)** $x^2 + y^2 - z^2$ **h)** $3(2z - x)$

i) $(x + y)(y - z)$ **j)** $(xyz)^3$ **k)** $2z(4y - 3x)$ **l)** $2z^2 - 3y^2 - 4x^2$

To complete the table of values for $y = x^2 - 5x$, substitute the given values for x in $x^2 - 5x$ and determine y.

$y = x^2 - 5x$

x	y
−2	
0	
2	

When $x = 2$, $y = (2)^2 - 5(2)$
$= 4 - 10$
$= -6$

When $x = 0$, $y = (0)^2 - 5(0)$
$= 0 - 0$
$= 0$

When $x = -2$, $y = (-2)^2 - 5(-2)$
$= 4 + 10$
$= 14$

$y = x^2 - 5x$

x	y
−2	−6
0	0
2	14

Solving equations

To solve $2x - 3 = 11$, isolate the variable.

$$2x - 3 = 11$$

Add 3 to both sides: $2x - 3 + 3 = 11 + 3$

Simplify: $2x = 14$

Divide both sides by 2: $\frac{2x}{2} = \frac{14}{2}$

Simplify: $x = 7$

To check, substitute 7 for x in the original equation.

L.S. $= 2x - 3$ **R.S.** $= 11$

$= 2(7) - 3$

$= 14 - 3$

$= 11$

Since L.S. = R.S., the solution is $x = 7$.

1. Solve and check.

a) $3x + 2 = 11$ **b)** $2x - 5 = 7$ **c)** $5x - 2 = -17$

d) $4x - 7 = 9$ **e)** $1 - 2x = 15$ **f)** $8 + 7x = -6$

g) $3x + 4 = 2x + 5$ **h)** $5x + 7 = 3x - 9$ **i)** $2x - 3 = 5x + 9$

To solve $3(x - 2) = 9$, expand to remove the brackets.

$$3(x - 2) = 9$$

Expand: $3x - 6 = 9$

Add 6 to both sides: $3x - 6 + 6 = 9 + 6$

Simplify: $3x = 15$

Divide both sides by 3: $\frac{3x}{3} = \frac{15}{3}$

Simplify: $x = 5$

To check, substitute 5 for x in the original equation.

L.S. $= 3(x - 2)$ **R.S.** $= 9$

$= 3(5 - 2)$

$= 3(3)$

$= 9$

Since L.S. = R.S., the solution is $x = 5$.

2. Solve and check.

a) $2(x + 4) = 10$ **b)** $4(x - 1) = 16$ **c)** $6(x - 5) + 7 = 1$

d) $5(x + 1) = -15$ **e)** $2(x - 3) = 3(x + 1)$ **f)** $5(x - 3) = 3(x + 7)$

g) $7(x + 2) - 3(x - 4) = 30$ **h)** $5(x - 2) + 3(x - 1) = 3$ **i)** $7(x + 6) - (x + 7) = -1$