

Examples

Workout



Click here



Scan here

Question 1: Write an algebraic expression for each of the following

- | | | | |
|--------------------------|--------------------|---------------------|----------------------|
| (a) 4 more than c | (b) 2 lots of a | (c) 3 less than b | (d) m divided by 5 |
| (e) 7 multiplied by s | (f) w subtract 1 | (g) e squared | (h) y add 9 |
| (i) m shared between 3 | (j) 10 times x | (k) k less than 8 | (l) 12 less than g |

Question 2: Write an algebraic expression for each of the following

- | | | | |
|---|-------------------------|-----------------------|---------------------------|
| (a) c add p | (b) f minus m | (c) a times b | (d) p divided by z |
| (e) b taken away from u | (f) k add n add r | (g) w less than c | (h) l multiplied by m |
| (i) y multiplied by m multiplied by a | | | |

Question 3: Write an algebraic expression for each of the following

- | | |
|--|--|
| (a) m multiplied by 2 and then add 3 | (b) h divided by 4 and then add 7 |
| (c) p squared and then add 10 | (d) t add 2 and then multiplied by 5 |
| (e) 9 times e and then add 1 | (f) h divided by 3 then add 1 |
| (g) m subtract 6 and then divided by 3 | (h) y squared and then multiplied by 4 |
| (i) k multiplied by 4 and then squared | (j) a squared and then multiplied by b |

Apply

Question 1: An orange costs y pence, an apple costs z pence and a banana costs 17 pence.
Write an expression for the total cost of:

- | | | |
|---|---|-----------------------------|
| (a) 3 oranges | (b) 5 apples | (c) 2 oranges and 3 apples |
| (d) 2 apples and 1 banana | (e) m bananas | (f) 3 oranges and 3 bananas |
| (g) 20 apples, 10 oranges and 2 bananas | (h) 4 oranges, 3 apples and n bananas | |

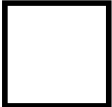

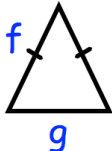
Forming Expressions

Video 16 on www.corbettmaths.com

Question 2: A taxi driver charges £m per mile.
Write an expression for the total cost of:

- (a) A 2 mile journey (b) A 15 mile journey (c) A journey of x miles

Question 3: Write an expression for the perimeter of each shape below.

- (a)  (b)  (c) 

Question 4: Alan is y years old and has 8 sisters.
Write an expression for how old each sister is.

- (a) Beth is 3 years old than Alan.
(b) Clara is 2 years younger than Alan.
(c) Donna is three times Alan's age.
(d) Emma is half Alan's age.
(e) Fiona is two years younger than Donna.
(f) Georgia is twice Beth's age.
(g) Hannah is 4 years older than Fiona.
(h) Isabelle is three times Clara's age.

Question 5: Guy, Eric and Luke go Christmas shopping.
Write an expression for how much money each man has left after shopping.

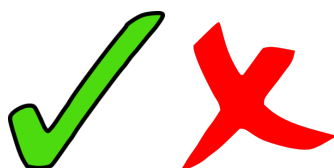
- (a) Guy had £20 and spends £y on presents.
(b) Eric had £m and spends £12 on presents.
(c) Luke had £a and spends £b on presents.

Question 6: A TV costs £x. A DVD player costs £45 less than the TV.
Write an expression for the total cost of the TV and DVD player.

Question 7: A plumber charges £15 per hour plus a £y initial callout charge.
Write an expression for the total cost of:

- (a) A job lasting 3 hours (b) A job lasting 8 hours (c) A job lasting n hours

Answers



Click here



Scan here

Examples



Click here



Scan here

Workout

Question 1: Simplify each of the following

- | | | | |
|--------------------------|--------------------------|-----------------------------------|---------------------|
| (a) $y + y + y + y$ | (b) $w + w + w + w + w$ | (c) $a + a + a + a + a + a$ | (d) $s + s + s$ |
| (e) $n + n$ | (f) $g + g + g + g - g$ | (g) $y + y + y + y - y - y$ | (h) $p + p - p - p$ |
| (i) $3y + 2y$ | (j) $4a + 3a$ | (k) $9k + 5k$ | (l) $7m + m$ |
| (m) $15c + 20c$ | (n) $6w - 3w$ | (o) $10y + 3y - 5y$ | (p) $20t - 14t$ |
| (q) $7x - 3x - x$ | (r) $8k - 8k$ | (s) $7y - 2y + y$ | (t) $5u - 4u$ |
| (u) $y^2 + y^2$ | (v) $a^2 + a^2 + a^2$ | (w) $c^2 + c^2 + c^2 + c^2 + c^2$ | (x) $7y^2 + 3y^2$ |
| (y) $2w^2 + 4w^2 + 8w^2$ | (z) $6y^2 - 2y^2 + 3y^2$ | | |

Question 2: Simplify the following expressions

- | | | | |
|--------------------------|--------------------|--------------------|-------------------|
| (a) $4u - 6u$ | (b) $8w - 9w$ | (c) $4a + 2a - 9a$ | (d) $2y - 9y$ |
| (e) $-3g - 2g$ | (f) $-4f + 9f$ | (g) $-m - 7m$ | (h) $5y^2 - 7y^2$ |
| (i) $6a^2 + 2a^2 - 9a^2$ | (j) $ab + ab + ab$ | | |

Question 3: Simplify the following expressions

- | | | |
|-----------------------------|---------------------------|--------------------------------|
| (a) $3a + 2b + 4a + b$ | (b) $7y + 5y + 2h + 2h$ | (c) $g + 8a + 2a + g$ |
| (d) $7m + 7p + 8m + p + 2p$ | (e) $9e + 2 + e + 2$ | (f) $4 + 3a + 2a + 8$ |
| (g) $2y + 4 + 3y - 1$ | (h) $8 + 3w - w - 3$ | (i) $5 - 4s - 2 + 10s$ |
| (j) $3x + 6y + 5x - 2y$ | (k) $6m - 2s + 11s + m$ | (l) $2a + 3b - 2 + a + 3b + 4$ |
| (m) $3a - 2b + a - 5b$ | (n) $2x - 2y - 6x + 5y$ | (o) $y - 4m - 3y - 5m$ |
| (p) $7p - 2q - q + 3r + 4r$ | (q) $11c + 8d - 6c - 11d$ | |

Collecting Like Terms

Video 9 on www.corbettmaths.com

Question 4: Simplify the following

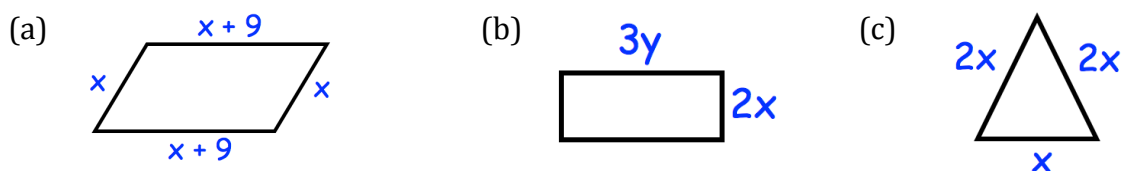
(a) $3y^2 + 4ab + 7y^2 + ab$ (b) $9x^2 - 2x - 11x^2 + 5x$ (c) $7ac - 3ab + 9ab - 7ac$

Question 5: Expand and simplify the following

(a) $2(y + 3) + 3(y + 1)$	(b) $8(x + 2) + 3(x + 3)$	(c) $4(x - 1) + 2(x + 3)$
(d) $5x + 3 + 2(x + 9)$	(e) $3(2y + 1) + 4(2y + 5)$	(f) $5(2x + 3) + 2(3x + 1)$
(g) $7(c + 2) + 3(c - 2)$	(h) $5(2a + 7) + 2(9a - 4)$	(i) $9(t + 3) + 3(2t - 11)$
(j) $2(x - 4) + 5(x - 2)$	(k) $6(y - 1) - 2(y + 3)$	(l) $8(x + 2) - 3(x - 2)$
(m) $5(2y - 3) + 3(y - 2)$	(n) $2(4w - 5) - 2(w - 7)$	(o) $5(3y + 7) - 3(2y - 5)$

Apply

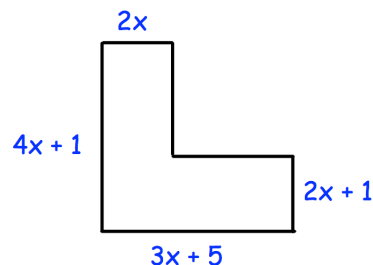
Question 1: Write down the perimeter of each shape below



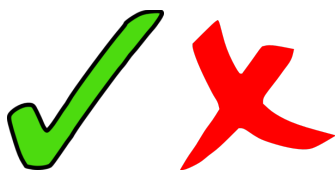
Question 2: A square has a side length of $3x$.
Find an expression for the perimeter of the square.

Question 3: $6x + 7y + x - 8y = 7x - y$
Write down three other expressions that are equal to $7x - y$

Question 4: Find an expression for the perimeter of this shape



Answers



Click here



Scan here

Examples



Click here



Scan here

Workout

Question 1: Expand the following brackets

- | | | | |
|------------------|-------------------|------------------|-----------------------|
| (a) $5(y + 3)$ | (b) $4(a + 2)$ | (c) $8(w + 10)$ | (d) $3(x - 7)$ |
| (e) $9(s - 1)$ | (f) $2(8 - t)$ | (g) $7(4 + h)$ | (h) $10(a + 2b + 3c)$ |
| (i) $4(3y + 2)$ | (j) $5(2p - 1)$ | (k) $3(7a + 2)$ | (l) $9(2x - 5)$ |
| (m) $5(4 + 3t)$ | (n) $7(9 - 2c)$ | (o) $8(3w + 1)$ | (p) $9(1 - 4p)$ |
| (q) $11(2k - 5)$ | (r) $20(6a + 5c)$ | (s) $3(15w - 7)$ | (t) $3(9 - 2a)$ |

Question 2: Expand the following brackets

- | | | | |
|-----------------|------------------|------------------|-------------------|
| (a) $-2(w + 5)$ | (b) $-3(c + 7)$ | (c) $-8(c + 7)$ | (d) $-10(y - 2)$ |
| (e) $-7(g - 3)$ | (f) $-4(2w + 3)$ | (g) $-9(3w - 5)$ | (h) $-9(5x - 1)$ |
| (i) $-5(6 - c)$ | (j) $-6(4 + 3m)$ | (k) $-2(1 + 9c)$ | (l) $-5(8a - 7w)$ |

Question 3: Expand the following brackets

- | | | | |
|------------------|------------------|------------------|-------------------|
| (a) $a(c + 2)$ | (b) $c(d - 3)$ | (c) $a(b + c)$ | (d) $w(8 - y)$ |
| (e) $c(5 + a)$ | (f) $w(a - 9)$ | (g) $y(s + t)$ | (h) $2a(c - 3)$ |
| (i) $5x(y + 8)$ | (j) $3a(2c + 9)$ | (k) $6g(2c - 1)$ | (l) $9k(2 + d)$ |
| (m) $5(2f + 9w)$ | (n) $3y(5p + 2)$ | (o) $2s(t + 1)$ | (p) $-4a(8x - 3)$ |

Question 4: Expand the following brackets

- | | | | |
|-----------------|------------------|------------------|-------------------|
| (a) $a(a + 2)$ | (b) $y(y - 5)$ | (c) $w(a + w)$ | (d) $c(9 - c)$ |
| (e) $p(2p + 5)$ | (f) $2w(3w - 1)$ | (g) $9y(2y + 3)$ | (h) $4c(2a + 5c)$ |

Expanding Brackets

Video 13 on www.corbettmaths.com

- (i) $2u(3 - u)$ (j) $m(m^2 + 3)$ (k) $y(y^2 - 7)$ (l) $g^2(g - 8)$
 (m) $2w(w^2 + 6)$ (n) $4a(2a^2 - 3)$ (o) $5c(3c^2 - a)$ (p) $8w(3w^2 + 3y)$
 (q) $x^2(x^2 + 4)$ (r) $3w^2(7 + 2w^2)$

Question 5: Expand and simplify

- (a) $5(y + 3) + 2(y + 7)$ (b) $6(2w + 5) + 9(w + 2)$ (c) $3(y - 2) + 4(2y + 5)$
 (d) $7(2g + 3) - 5(g + 2)$ (e) $6(x - 2) - 4(x - 8)$ (f) $2(3y - 8) - 5(2y - 1)$
 (g) $8(5 + 2m) + 3(5 - 3m)$ (h) $4(w + 7) - 2(2w + 1)$ (i) $9(1 + 2y) + 3(3 - y)$

Question 6: Expand and simplify

- (a) $w(w + 5) + w(w + 7)$ (b) $2g(4g + 3) + g(g - 7)$ (c) $n(n - 4) - n(5 - n)$
 (d) $2e(4e + 3) - 3e(e - 5)$ (e) $a(3 + c) + c(a + 2)$ (f) $m(a + 7) - a(4 - 3m)$
 (g) $8c(8 - 3a) + 3(4 - c)$ (h) $5y(3y + z) - 2y(4y - 3z)$ (i) $4c(3c - c^2) - 2c^2(4 - 5c)$

Apply

Question 1: Can you spot any mistakes in the questions below.

Expand $3(2y - 1)$

$$6y - 1$$

Multiply out $x(x + 3)$

$$2x + 3x = 5x$$

Expand and simplify $6(w + 3) - 2(w - 5)$

$$\begin{aligned} &6w + 18 - 2w - 10 \\ &= 4w + 8 \end{aligned}$$

Answers



Click here



Scan here

Examples

Workout



Click here



Scan here

Question 1: Factorise the following expressions

- | | | | |
|-----------------|-----------------|------------------|-----------------------|
| (a) $4x + 6$ | (b) $15x + 20$ | (c) $9y - 12$ | (d) $5x + 15$ |
| (e) $6x - 3$ | (f) $4x + 8$ | (g) $5y - 25$ | (h) $8w + 24$ |
| (i) $10y + 15$ | (j) $14w + 21$ | (k) $20y - 30$ | (l) $27x + 18$ |
| (m) $6 - 4x$ | (n) $9 + 12y$ | (o) $45 + 60x$ | (p) $16y - 32$ |
| (q) $22a + 55$ | (r) $100 - 40y$ | (s) $6x + 9y$ | (t) $4w - 2a$ |
| (u) $25y - 35z$ | (v) $8x^2 + 20$ | (w) $30y^3 - 15$ | (x) $42y + 28x - 56c$ |

Question 2: Factorise the following expressions

- | | | | |
|-------------------|-------------------|-------------------|-------------------|
| (a) $x^2 + 7x$ | (b) $x^2 - 3x$ | (c) $y^2 + y$ | (d) $w^2 + 9w$ |
| (e) $x^2 - 7x$ | (f) $4w^2 + 10w$ | (g) $6x^2 - 8x$ | (h) $9y^2 - 6y$ |
| (i) $10c + c^2$ | (j) $5g - g^2$ | (k) $14x^2 + 35x$ | (l) $40x^2 - 50x$ |
| (m) $12x^2 + 18x$ | (n) $24x^2 - 18x$ | (o) $45y^2 + 60y$ | (p) $7w^2 + 2w$ |

Question 3: Factorise the following expressions

- | | | | |
|--------------------|----------------------|--------------------|---------------------------|
| (a) $x^2 + xy$ | (b) $a^2 - ab$ | (c) $xy + xz$ | (d) $ab + ac - ad$ |
| (e) $6c^2 - 4cd$ | (f) $10x^2 + 15xy$ | (g) $12ab + 18bc$ | (h) $8xy + 4y^2$ |
| (i) $8cdf + 10cde$ | (j) $7w^2 + 6w + wy$ | (k) $8ab^2 - 10ab$ | (l) $4xy^2 + 6xy + 2x^2y$ |
| (m) $6mn - 7m^2n$ | (n) $11g^2h + 22h^2$ | | |

Question 4: Factorise the following expressions

- | | | | |
|---------------------|-------------------|--------------------|---------------------|
| (a) $x^3 + 2x^2$ | (b) $5x^3 - x^2$ | (c) $8c^3 + 12c$ | (d) $10w^2 - 15w^3$ |
| (e) $32y^3 + 24y^2$ | (f) $12x^4 + 15x$ | (g) $4a^5 - 12a^2$ | (h) $8w^9 + w^7$ |

Apply

- Question 1: Explain why $8x + 3y$ cannot be factorised.
- Question 2: James has factorised an expression correctly.
His answer is $2(7y - 3)$.
What was the expression that he factorised?
- Question 3: Alexandra is trying to factorise fully $15y + 30$.
Rebecca says the answer is $3(5y + 10)$
Victoria says the answer is $5(3y + 6)$
Alexandra says both Rebecca and Victoria are incorrect, why?
- Question 4: Can you spot any mistakes?

Factorise

$$w^2 - 5w$$

$$\frac{w(w + 5)}{(1)}$$

Question 5: Can you spot any mistakes?

Factorise completely

$$24x^2 + 20x$$

$$\frac{4(6x^2 + 5x)}{(2)}$$

Question 6: Can you spot any mistakes?

Factorise completely

$$20a^2c + 30ac$$

$$\frac{5ac(4a^2 + 6)}{(2)}$$

Answers



Click here

Scan here

Examples



Click here



Scan here

Workout

Question 1: Make y the subject of each of the following

- | | | |
|-----------------------|------------------------|----------------------|
| (a) $y + w = c$ | (b) $y - p = m$ | (c) $m + y = s$ |
| (d) $y - 2g = n$ | (e) $3y = c$ | (f) $ay = w$ |
| (g) $\frac{y}{c} = w$ | (h) $\frac{y}{a} = 2c$ | (i) $a = y + p$ |
| (j) $c = y - k$ | (k) $y^2 = s$ | (l) $y^3 = x$ |
| (m) $\sqrt{y} = g$ | (n) $\pi y = c$ | (o) $n - y = t$ |
| (p) $ry = c$ | (q) $4\pi y = b$ | (r) $y + 7t = c + r$ |
| (s) $\frac{r}{y} = w$ | (t) $y^2 = k + x$ | (u) $A = xy$ |

Question 2: Make x the subject of the following formulae

- | | | |
|---------------------------|---------------------------|---------------------------------|
| (a) $4x + c = w$ | (b) $dx - t = 8$ | (c) $x^2 + 3 = h$ |
| (d) $2x + 2y = P$ | (e) $s = x^2 - 3$ | (f) $y = xz + s$ |
| (g) $\frac{x}{n} + 2 = w$ | (h) $\frac{x}{6} - 5 = w$ | (i) $\frac{x+3}{c} = h$ |
| (j) $3y = 4x + 1$ | (k) $x^2 + a = v$ | (l) $x^3 - 4 = 5y$ |
| (m) $\frac{x+t}{m} = 2c$ | (n) $\frac{w+x}{u} = 3z$ | (o) $A = \pi x^2$ |
| (p) $A = \frac{1}{2}bx$ | (q) $V = abx$ | (r) $v^2 = u^2 + 2ax$ |
| (s) $\frac{a+b}{x} = r$ | (t) $\frac{5cx}{b} = a$ | (u) $\sqrt[3]{\frac{x}{k}} = w$ |

Question 3: Make c the subject of the following

- | | | |
|---------------------|------------------|---------------------|
| (a) $(a + c)^2 = t$ | (b) $v = u + ac$ | (c) $v = \pi c^2 h$ |
|---------------------|------------------|---------------------|

Apply

Question 1: The circumference of a circle is given as $c = 2\pi r$
Make the radius, r , the subject of the formula.

Question 2: The formula to convert degrees Fahrenheit to degree Celsius is $\frac{5}{9} (F - 32) = C$

Find the formula to convert from degrees Celsius to degrees Fahrenheit by making F the subject.

Question 3: Can you spot any mistakes below?

Make y the subject of the formula:

$$k = y^2 + a$$

$$\sqrt{k} = y + a$$

$$\sqrt{k} - a = y$$

$$y = \sqrt{k} - a$$

Express v in terms of t

$$t = \frac{v}{4} + 1$$

$$t - 1 = \frac{v}{4}$$

$$\frac{t - 1}{4} = v$$

Answers



Click here



Scan here