

Name: _____

Date: _____

1. Complete the following:

(a) $-5 \times (-8) =$

(b) $+5 \times (-6) =$

(c) $-6 \times (+7) =$

(d) $-9 \times 3 =$

(e) $16 \div 2 =$

(f) $-24 \div 3 =$

(g) $42 \div (-6) =$

(h) $-36 \div (-4) =$

2. Multiply out the following expressions.

Example 1: $6(p+4x) = 6p + 24x$

Example 2: $4z(3z-2q+4) = 12z^2 - 8zq + 16z$

a) $5(x+4)$

b) $2(y-3)$

c) $4(3-a)$

d) $x(2+x)$

e) $p(q+3)$

f) $-3(2+a)$

g) $s(t-s)$

h) $-2(b-3)$

i) $5a(2b+3c)$

3. Multiply out the expression and group like terms in the following:

Example 1: $4 + 7(q + 2) = 4 + 7q + 14$
 $= 7q + 18$

Example 2: $8b + 3x^2 + 3x(b+x) + 2b = 8b + 3x^2 + 3xb + 3x^2 + 2b$
 $= 6x^2 + 3xb + 10b$

a) $5 + 2(x + 1)$

b) $3x + 4(2x - 1)$

c) $6a - 3(a + 2)$

d) $x^2 - x(1 + x)$

e) $12c - 5(2c - 1)$

f) $7r + 2(3 + 4r)$

g) $5pq - p(2 - p)$

h) $4(y + 3x) - 2y + 3x$

i) $5(2a - b) + 3(4b - 3a)$

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Given below are a selection of formulae relating to areas, perimeters and volumes of geometric shapes.

Circles: $A = \pi r^2 = \pi \left(\frac{d^2}{4} \right)$ and $C = 2\pi r = \pi d$

where A is the area, C is the circumference, r is the radius and d is the diameter.

Rectangles: $A = wh$ and $P = 2(w + h)$

where A is the area, P is the perimeter, w is the width and h is the height.

Spheres: $V = \frac{4}{3}\pi r^3$ and $A = 4\pi r^2$

where V is the volume, A is the surface area and r is the radius.

Cylinders: $V = \pi r^2 h$, $C = 2\pi r h$ and $A = 2\pi r(r + h)$

where V is the volume, C is the curved surface area, A is the surface area of a solid cylinder (including the ends), r is the radius and h is the height.

In the following exercises give your answer correct to 1 decimal place.

1. What is the area of a circle with radius 3cm?
2. What is the circumference of a circle with diameter 5cm?
3. What is the perimeter of a rectangle with width 5cm and height 8 cm?
4. What is the volume of a sphere with radius 2cm?
5. What is the curved surface area of a cylinder with radius 10cm and height 40cm?
6. What is the area of a rectangle with width 3.5 cm and height 5.2 cm?
7. What is the surface area of a sphere with radius 4.7 cm?

5. Rearrange each of the following formulae to make the quantity shown the subject.

Example 1: $v = ir + E$, E
 $E = v - ir$

Example 2: $v = ir + E$, i
 $v - E = ir$
 $i = (v - E)/r$

a) $v = u + at$, u

b) $v^2 = u^2 + 2as$, s

c) $s = vt + \frac{1}{2}at^2$, a

d) $p = 2(w + h)$, h

e) $A = 2\pi r^2 + 2\pi rh$, h

f) $E = \frac{1}{2}mv^2 + mgh$, v

g) $E = \frac{1}{2}mv^2 + mgh$, m

6. *If you've still got time, try this:-*

Find x, y and z in the following set of simultaneous equations.

$$\begin{aligned}2x + y - z &= 1 \\5x + 2y - 2z &= 3 \\3x + 4y - 3z &= 2\end{aligned}$$