

1. If x is a number, you multiply it by itself, subtract five from this, and then divide the result by 2, what do you get? (Your answer will be in terms of x , of course.)

2. How can you expand/simplify the following expressions? Don't just give the answer from memory—explain (to yourself) why they're true. Note that for some of them, there's no good way to expand or simplify the expression.

(a) $(xy)^2$

(b) $a(b + c)$

(c) $(a + b)(c + d)$

(d) $(x + y)^2$

(e) $\sqrt{x + y}$

3. Does the equation $x^2 + y^2 = 1$ represent any geometric shape? In what way?

4. Solve the following equation:

$$\frac{5}{2d - 4} = 9$$

5. Here are some pairs of equations. For each pair, are the two equations equivalent to each other? For that matter, what does it mean for two equations to be equivalent to each other?

(a) $x + y + z = 1$ and $x + y = 1 - z$

(b) $x^2 + x = 0$ and $x + 1 = 0$

(c) $2x^2 + 4x + 6 = 0$ and $x^2 + 2x + 3 = 0$