Loughborough University

Week 1: Algebra Basics

Try these exercises now, do not use a calculator, and try to solve the exercises without help

1. Do you expect your answer to $\frac{3}{8} \times \frac{4}{5}$ to be greater than $\frac{1}{2}$? Why or why not? Calculate the answer.
2. Calculate the value of $7^0 + 12^1$.
3. Explain the distinction, if any, between each of the following expressions, and simplify if possible. (a) $4x - 2x$, (b) $4x(-2x)$, (c) $4x(2x)$, (d) $-4x(2x)$, (e) $-4x - 2x$, (f) $(4x)(2x)$
4. Explain the distinction between $(x + 3)(x + 2)$ and $x + 3(x + 2)$.
5. Factorise (a) $6x^2 + 7x - 5$ and (b) $4x^2 - 9$
6. Simplify, if possible, $\frac{x^2+2x-15}{2x^2-5x-3}$
7. Transpose $v = \sqrt{x + 2y}$, (a) for x, (b) for y.
8. The surface area of a sphere is given by the formula $SA = 4\pi r^2$. If the sphere has a surface area of 20 cm^2, what is the radius of the sphere?