MA014G
Algebra and Discrete Maths
Self-assessment Basic Algebra Test

This is a *timed* self-assessment test. Make a print-out of it and do it one day, when you have half an hour where you know nobody is going to disturb you. Set an alarm clock to ring after **half an hour**, do the test and then check your answers against the answers on the course website.

Please note that calculators must not be used for this test!

Good Luck!

[Q1] Simplify the following expressions as much as possible.

(a) $3x + 7y - 2y =$ _____

(b) $14m - 6k - 5m + 3k + k + m =$ _____

(c) $4x^2 + 2x + 3x^2 + 5 + x + 1 =$ _____

(d) $5 + 3x^2 - 4 + 6x - 3x - 1 =$ _____

(e) $5x^2 \cdot 2x^2 =$ _____

(f) $4y^2 \cdot 5y^3 =$ _____

(g) $2(3x + 4) - 3(2 - x) =$ _____

(h) $\dfrac{x(2x)^2 - 2x^2}{2x^2 - x} =$ _____

(i) $\dfrac{3x - 4}{3x} - \dfrac{2x - 3}{2x} =$ _____

(j) $\left(\dfrac{a+2}{a-2} - \dfrac{a-2}{a+2}\right)^{-1} =$ _____

[Q2] Expand (sv: utveckla) and simplify the following expressions.

(a) $(x - y)(x + y) =$ _____

(b) $(2a-3)(2a+3) =$ _____

(c) $(x-3)(x+2) - x^2 + 8 =$ _____

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

(e) $(x+1)(x-2)(x+3) =$ _____

(f) $(x+1)(2x^2 - x + 3) =$ _____

(g) $(x - 2x - 1)(2x^2 - x + 3) =$ _____

(h) $(2x + 3y - 1)^2 =$ _____

(i) $(a+b)^2 =$ _____

(j) $(a+b)^4 =$ _____

[**Q3**] Solve the following equations.

(a) $x + 5 = 11$. Answer: $x =$ _____

(b) $6a = 20$. Answer: $a =$ _____

(c) $b/3 = -5$. Answer: $b =$ _____

(d) $3x + 5 = 10x$. Answer: $x =$ _____

(e) $2x - 5 = 7$. Answer: $x =$ _____

(f) $2x + 2 = x + 4$. Answer: $x =$ _____

(g) $5x - 2 = 12 - 3x$. Answer: $x =$ _____

(h) $2(5x + 1) = 4(3x - 7)$. Answer: $x =$ _____

(i) $2(2x + 1) - 3(x - 1) = 8$. Answer: $x =$ _____

(j) $x^2 = 4$. Answer: $x =$ _____

[Q4] **(a)** Solve the inequality $5x + 2 > 12$. Answer: _____

(b) Solve the inequality $-2x + 3 > 13$. Answer: _____

(c) Simplify the following expression.

$(\sqrt{12} - \sqrt{3})^2 =$ ____

(d) Suppose that $f(x) = 2(3x - 4)$.
Then $f(4) =$ _____

(e) The area of a triangle is

$$\tfrac{1}{2}bh$$

where b denotes the length of the base and h the height of the triangle. The area of a triangle with $b = 7$ cm and $h = 4$ cm is _____