STUDENT NAME:
TIME USED:

MA004G
Mathematics Education for Primary and Secondary School

Basic Algebra Test

This is a *timed* test, the time allowed is 45 minutes. If you finish early, please indicate on the front page of the test how long you took to do the test. Please do not use separate sheets of paper, use the back of sheets to do rough work if necessary.

Hand in your test to the lecturer at 8.15am on 1 September 2010.

Please note that calculators or books 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 _____