

## Algebra and Functions

1. Expand the following expressions:

a)  $3(x+5)$

b)  $(x+2)(x-8)$

c)  $3(x+2)^2$

d)  $2(x-3)(x+3)$

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

f)  $2(2x+1)(x-4)^2$

2. Fill in the blanks:

a)  $(x-2)(x\dots\dots) = x^2 + 16x - 36$

b)  $(x+3)(x-4)(\dots\dots\dots) = 2x^3 \dots\dots\dots + 60$

c)  $(x-2)(x\dots\dots) = x^2 \dots\dots\dots + 12$

d)  $2(x+1)(x-3)(\dots\dots\dots) = 10x^3 \dots\dots\dots - 36$

3. Given  $f(x) = 5x+4$  and  $g(x) = 3x-2$ :

i) Simplify the following:

a)  $f(x) + g(x)$

b)  $f(x) \cdot g(x)$

c)  $(1+x) \cdot f(x) + (3-x) \cdot g(x)$

d)

$[f(x)]^2 - [g(x)]^2$

ii) If  $f(x) \cdot g(x) \cdot h(x) = 15x^3 \dots\dots\dots + 32$ , fill in the blanks and find  $h(x)$ .

iii) Simplify the expression  $f(g(x)) + g(f(x))$