Algebra practice   Name

Directions:
Show all work on a separate piece of paper. Place your final answer on this sheet.

1. Given $g(x) = \dfrac{3}{x-1}$
   a. Evaluate and simplify completely

   i) $g(-2) =$ ii) $g(0) =$ iii) $g(1) =$ iv) $g(4) =$ v) $g(x+3) =$

   b. Solve algebraically for exact x

   i) $g(x) = 5$ ii) $g(x+2) = 4$ iii) $g(x) + 2 = 4$
   $x =$ $x =$ $x =$

2. Simply the difference quotient for the following functions [different quotient $\dfrac{f(x+h) - f(x)}{h}$]

   a) $f(x) = x^2 + 2x + 3$ $\dfrac{f(x+h) - f(x)}{h} =$

   b) $f(x) = x^3 - 5$ $\dfrac{f(x+h) - f(x)}{h} =$

   c) $f(x) = \dfrac{4}{x}$ $\dfrac{f(x+h) - f(x)}{h} =$

3. Simplify the following completely with a common denominator. Your final answer will not contain any negative exponents.

a) $\dfrac{4x}{x-1} - \dfrac{5x+2}{2x} =$ b) $\dfrac{(b+2)^x}{(b+2)^{4x-2}} =$

c) $\dfrac{1+2t}{\sqrt{t+3}} + 2\sqrt{t+3} =$ d) $\dfrac{(x^2+1)\dfrac{1}{2\sqrt{x}} - \sqrt{x}(2x)}{(x^2+1)^2} =$

e) $\dfrac{2}{x+5} - \dfrac{3}{x-5} =$ f) $\dfrac{4(z+2)^{\frac{1}{2}} - 2z(z+2)^{-\frac{1}{2}}}{z+2} =$

g) $\dfrac{a^n 3^{n+1}}{3^n a^{n+1}} =$ h) $e^x e^{1-x} =$

i) $\dfrac{(x^3+1)^2 - 6x^3(x^3+1)}{(x^3+1)^4} =$ j) $\dfrac{5}{\sqrt{1-z^2}} - 3\sqrt{1-z^2} =$