1 Given: $f(x) = \dfrac{x+2}{x+3}$ and $g(x) = 2x + 5$. **What is the equation that represents** $(f \circ g)(x)$?

2 Given function f such that $f(x) = 2x - 1$ and function g defined by $g(x) = 3x^2 + 5$.

a) **What is the rule of $(g \circ f)(x)$**?

b) **What is the value of $(g \circ f)(5)$**?

3 Given $f(x) = 4x + 1$ and $g(x) = -|x - 2| + 3$. **What are the domain and range of $(g \circ f)(x)$**?

4 Given $f(x) = \dfrac{2x^2 + 3}{1 - x}$ and $g(x) = -x + 2$. **Determine** $(f \circ g)(x)$.

5 Given $f(x) = 2\sqrt{x-3} + 6$ and $g(x) = -4x + 5$. **Determine** $(g \circ f)(x)$**.**

6 The function g is defined by the following rule: $g(x) = \dfrac{x+2}{4x+20}$. **What is the rule of its inverse g^{-1}**?

7 Given $f(x) = 3x + 4$ and $g(x) = 5x - 7$. The function h is defined by $h(x) = \dfrac{f(x)}{g(x)}$, where $g(x) \neq 0$.

What are the domain and range of function *h*?

8 Given the rational function $f(x) = \dfrac{3x+5}{2x-1}$. What are the equations of the asymptotes of this function?

9 Given the function f defined by $f(x) = \dfrac{8x-2}{3x}$ and the function h defined by $h(x) = \dfrac{12x+4}{2x+1}$.

Which of the following can be used to obtain the function *g* defined by $g(x) = \dfrac{52x^2 + 16x - 2}{6x^2 + 3x}$**, given the rules of *f and h***?

A) $(f \circ h)(x) = g(x)$

B) $(f + h)(x) = g(x)$

C) $(f \bullet h)(x) = g(x)$

D) $(f - h)(x) = g(x)$

10 Given the function $f(x) = \dfrac{-10}{x+1} + 3$. **What is the rule of correspondence of the inverse of this function**?

11 Max's New Year's resolution was to lose weight by paying strict attention to the food he ate. Since then, his weight has varied according to the function whose rule is: $M(t) = \dfrac{500}{t + 50} + 80$

where t represents the number of days gone by since January 1st,and $m(t)$ represents Max's weight in kilograms.

According to the rule of this function, what minimum weight can Max hope to reach?

12 Given the function $f(x) = \dfrac{7}{-3x - 12} - 5$**. What is the rule for $f^{-1}(x)$**?

13 A mathematical relationship exists between the number of students who participate in the end-of-year school activities and the amount of money students will be charged to participate.
The greater the number of participants, the less each has to pay. This relation is represented by the following function: $\mathrm{N}(p) = \dfrac{87\ 453}{3p - 300} + 1522$
where p is the price of the activities; and N(p) is the number of students participating.

At least 70% of the 1230 students in County High must agree to participate, before the end-of-year activities will be approved.
What is the maximum price the school can charge for the end-of-year activities?

14 Consider the rational function $f(x) = \dfrac{2x - 1}{4 - x}$. **What is the solution set of the inequality** $f(x) \geq 0$?