

Quiz 3

Show *all* your work algebraically for each. No credit is given without supporting work. There are *two* sides to this quiz.

1. Let $s(x) = \frac{1}{x}$.

(a) [2] (§2.5 #9) Write down the rule of $(3s - 2s)(x)$.

(b) [2] (§2.5 #21) Write down the rule of

$$\frac{s(3+x) - s(3)}{x}$$

(c) [1] (§2.5 #21) Simplify the rule in (b) as much as possible.

Something to watch for: the expression in (1b) is known as the “difference quotient at 3” of the function s and dominates first quarter calculus.

2. Let $m(x) = x^3 - \frac{1}{2}x^2 - \frac{13}{2}x - 3$ and $n(x) = x^2 - x - 6$.

(a) [3] (§2.5 #31) Use long division to write $\frac{m}{n}(x)$ as a 'mixed rational function'. Or more accurately, write $\frac{m}{n}(x)$ as an expression in the form $G(x) + \frac{R(x)}{n(x)}$, where G and R are polynomials with $\deg(R) < \deg(n)$.

(b) [1] Use the above result to factor m completely.

(c) [1] Find the roots of m .