

Question 8

Let $f(x) = \log_b x$, where $b > 0$ and $b \neq 1$. Suppose that

$$f(2) = 1 \quad \text{and} \quad f(5) \approx 2.32193.$$

- (a) Estimate $f(10)$ using logarithm properties.
- (b) Estimate $f(5/2)$ using logarithm properties.
- (c) Explain the properties used.

Question 8 - Solution

The product and quotient laws hold for positive arguments:

$$f(10) = f(2) + f(5) \approx 1 + 2.32193 = \boxed{3.32193},$$

$$f(5/2) = f(5) - f(2) \approx 2.32193 - 1 = \boxed{1.32193}.$$

The datum $\log_b 2 = 1$ fixes $b = 2$, so the supplied approximation to $\log_b 5$ is consistent with the same base.