



Problem of the Week

Problem E

This is Some Function

For some function $f(x) = ax^3 + bx^2 + cx + d$ where a , b , c and d are integers, we know the following information:

- the y -intercept is 5,
- $f(2) = -3$,
- $40 < f(4) < 50$, and
- $240 < f(6) < 250$.

Determine the value of $f(3)$.



The following notes about solving inequalities may be helpful in solving the above problem. The example, “Solve for x so that $20 < 8x + 5 < 28$ ”, is used to illustrate steps that can be used in solving inequalities.

- You may add or subtract a constant from each of the parts of the inequality without changing the sense of the inequality. Using the example,

Subtracting 5 from each part of the inequality	$20 < 8x + 5 < 28$
leaves the sense of the inequality unchanged.	$15 < 8x < 23$

- You may multiply or divide each of the parts of the inequality by a positive number without changing the sense of the inequality. Continuing from where we left off in the example,

Dividing each part of the inequality by 8	$15 < 8x < 23$
leaves the sense of the inequality unchanged.	$\frac{15}{8} < x < \frac{23}{8}$

