#24

What does it mean that $-\frac{1}{2}$ is a root of $f(x)$?

It means that $f\left(-\frac{1}{2}\right) = 0$ and it also means that $x - \left(-\frac{1}{2}\right)$ is a factor of $f(x)$.

Let's find $f\left(-\frac{1}{2}\right) = 2\cdot\left(-\frac{1}{2}\right)^3 - 5\cdot\left(-\frac{1}{2}\right)^2 + \left(-\frac{1}{2}\right) + 2 =$

$= -2\cdot\frac{1}{8} - 5\cdot\frac{1}{4} - \frac{1\cdot 2}{2\cdot 2} + 2 = -\frac{1}{4} - \frac{5}{4} - \frac{2}{4} + 2 = -\frac{8}{4} + 2 =$

$= -2 + 2 = 0$

Hence, $-\frac{1}{2}$ is a zero of $f(x)$

#25 to find horizental asymptote(s) we need to find the degree of the numerator (n) and the degree of the denominator (m)

$3x - 6x^2 + 10 = -6x^2 + 3x + 10$ degree $n = 2$

$(2x - 3)(x + 5)$: leading term is $2x^2$, hence degree $m = 2$

Since, the degrees of numerator and denominator are equal, i.e. $n = 2 = m$, then the horizontal asymptote $y = \frac{\text{leading coefficient of numerator}}{\text{leading coefficient of denominator}} = \frac{-6}{2} =$

Answer: $y = -3$ is the horizontal asymptote of $h(x)$