Exam 2 Review

1a) The graph showed that $P(x)$ had zeros, $x = -3, -1, 1$

by translating the formula up six units, the x-intercepts change.

b) x-intercepts $x = -3, -1, 1, 2$

y-intercepts $y = -18$

$\Rightarrow \boxed{P(x) = -3(x+3)(x+1)(x-1)(x-2)}$

2) $h(x) = -9x^2 - 6x + 11$

$= -9\left(x^2 + \frac{2}{3}x + \frac{1}{9}\right) + 11 + \underline{1}$

$\boxed{= -9\left(x + \frac{1}{3}\right)^2 + 12}$

$\boxed{\text{max value @ } x = -\frac{1}{3} \quad f(0) = 12}$

3) a) $g\left(g^{-1}\sqrt[3]{x + \pi^2}\right)$

inverses cancel so, $\boxed{= \sqrt[3]{x + \pi^2}}$

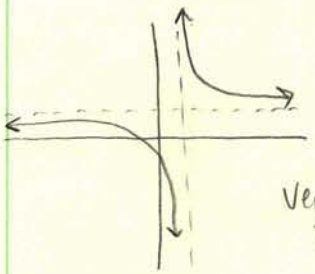
b) $f^{-1}(.5)$ DNE because it fails the horizontal line Test

only 1-1 functions have inverses, and $f(x)$ is not 1-1 so the inverse DNE

ci) $f(x) = \frac{3x-1}{5x-2}$

$f(a) = f(b)$

$\frac{3a-1}{5a-2} = \frac{3b-1}{5b-2}$ ✓



Vertical line Test ✓

$\boxed{\text{the function is 1-1}}$

ii) $f(x) = \frac{3x-1}{5x-2}$

$f^{-1}(x) = x = \frac{3y-1}{5y-2}$

$x(5y-2) = 3y - 1$

$5xy - 2x = 3y - 1$

$5xy - 3y = 2x - 1$

$y(5x-3) = 2x - 1$

$y = \frac{2x-1}{5x-3}$

$\boxed{f^{-1}(x) = \frac{2x-1}{5x-3}}$

iii) $f^{-1}(f(\ln 2)) = \boxed{\ln 2 \approx .6931}$