#31 To find y-intercepts, find $f(0)$ or when $x=0$

(a) $f(x) = (x-3)^2 - 6$

$f(0) = (0-3)^2 - 6 = 9-6 = 3$

Answer: 3 or point $(0, 3)$

(b) $g(x) = \dfrac{x-4}{x^2-x-6}$

$g(0) = \dfrac{0-4}{0^2-0-6} = \dfrac{-4}{-6} = \dfrac{2}{3}$

Answer: $\dfrac{2}{3}$ or point $\left(0, \dfrac{2}{3}\right)$

(c) $h(x) = 9x^2 - 10 + 6x^8 - 12x^5 + 8x$

$h(0) = 9 \cdot 0^2 - 10 + 6 \cdot 0^8 - 12 \cdot 0^5 + 8 \cdot 0 = -10$

Answer: -10 or point $(0, -10)$

#32 degree $= 3$

zeros: $4, 2i$ Since $2i$ is a root, then $-2i$ is a root

leading coefficient $a_3 = 2$

Following the Linearization Theorem:

$f(x) = a_3 (x - 4)(x - 2i)(x - (-2i))$

$f(x) = 2(x-4)(x-2i)(x+2i) = 2(x-4)(x^2 + 2ix$

$- 2xi - 4i^2) = 2(x-4)(x^2 - (-4)) = 2(x-4)(x^2+4) =$

$i^2 = -1$

$= 2(x^3 + 4x - 4x^2 - 16) = 2x^3 - 8x^2 + 8x - 32$