Thinking Questions

3) Explain how we can know that $f(x)=6x^6+2x^4+3x^2+8$ has no real roots just by looking at the terms of the polynomial function.

x^2, x^4, x^6 are perfect squares of (real) numbers.

All perfect squares are non-negative:

$6x^6 \geq 0,\ 2x^4 \geq 0,\ 3x^2 \geq 0$

$\therefore\ 6x^6+2x^4+3x^2 \geq 0$

and $6x^6+2x^4+3x^2+8 \geq 8 > 0$

$\therefore\ f(x) > 0$ for all real x and will not have real x-intercepts.