1. Is $2i$ a zero of this polynomial?

$y = 6x^4 - 7x^3 + 21x^2 - 28x - 12$

You could do synthetic division with 2i

$$\begin{array}{c|ccccc} 2i & 6 & -7 & 21 & -28 & -12 \\ & & 12i & -14i-24 & 28-6i & 12 \\ \hline & 6 & -7+12i & -14i-3 & -6i & 0 \end{array}$$

since synthetic division using 2i
leads to a remainder of 0, 2i must be a zero.

1. Is $2i$ a zero of this polynomial?

$y = 6x^4 - 7x^3 + 21x^2 - 28x - 12$

You could use the remainder theorem by finding f(2i).

$f(2i) = 6(2i)^4 - 7(2i)^3 + 21(2i)^2 - 28(2i) - 12$

$96 + 56i - 84 - 56i - 12 = 0$

Since f(2i) = 0, 2i must be a zero

1. Is $2i$ a zero of this polynomial?

$y = 6x^4 - 7x^3 + 21x^2 - 28x - 12$

Since 2i is a zero so is -2i. These two zeros came from the factor $x^2 + 4$. Do long division with this factor:

$$\begin{array}{r} 6x^2 - 7x - 3 \\ x^2+0x+4 \;\overline{)\; 6x^4 - 7x^3 + 21x^2 - 28x - 12} \\ -(6x^4 - 0x^3 + 24x^2) \\ \hline -7x^3 - 3x^2 - 28x \\ -(-7x^3 + 0x^2 - 28x) \\ \hline -3x^2 + 0x - 12 \\ -(-3x^2 + 0x - 12) \\ \hline 0 \end{array}$$

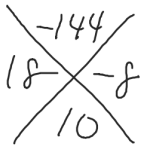
since long division using $x^2 + 4$
leads to a remainder of 0, 2i must be a zero.

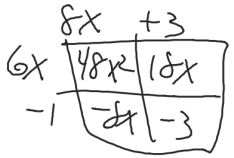
3. Given $x + 3$ is a factor of $y = 48x^3 + 154x^2 + 27x - 9$, find the other factors.

$$\begin{array}{c|cccc} -3 & 48 & 154 & 27 & -9 \\ & & -144 & -30 & 9 \\ \hline & 48 & +10 & -3 & 0 \end{array}$$

these numbers represent the quadratic:
$48x^2 + 10x - 3$

Factor this quadratic to get the other two factors:





(8x + 3) and (6x - 1)

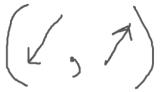
State the Degree, Leading Coefficient, and the End Behavior

1. $y = x^7 - 75x^4 + 3x^2 - 104$

DEG = 7

L.C. = 1

this is an POSITIVE ODD polynomial which means like a line with a positive slope this graph goes down on the left and up on the right



2. $f(x) = -2x^2(x+6)^2(2x+1)(5x-2)^3$

(-2)(1)(2)(125)

for the degree add the exponents

DEG: 8

the leading coefficient is the product of the coefficients of each factor after taking into account the exponents.

LC = -500

this is an NEGATIVE EVEN polynomial which means like a parabola that opens down this graph would go down on both the left and the right.

	Give the name of each polynomial by:	
$9x^2 - 7x + 145$	Degree	Quadratic
1857	# of Terms	Monomial
$11x^3$	Degree	Cubic
$9x - 3$	Degree	Linear

	Give the name of each polynomial by:	
-12.84	Degree	Constant
$x^4 + 3x^2 - 28$	# of Terms	Trinomial
$-5x^3 - 1$	# of Terms	Binomial