

Divide:

$4x^3 - 8x^2 + 3x - 8$  by  $2x - 1$

$$\begin{array}{r|rrrr} \frac{1}{2} & 4 & -8 & 3 & -8 \\ & & 2 & -3 & 0 \\ \hline & 4 & -6 & 0 & -8 \end{array}$$

$$4x^2 - 6x - \frac{8}{2x-1}$$

$$\frac{2x^2 - 3x - \frac{8}{2x-1}}{2x-1}$$

Write a polynomial function of minimum degree in standard form with real coefficients whose zeros include those listed.

2, 3,  $i-i$

~~-1, 2, 1-i~~

$$(x-2)(x-3)(x-i)(x+i)$$

$$(x^2-5x+6)(x^2+\cancel{xi}-\cancel{xi}-i^2)$$

$$(x^2-5x+6)(x^2-i^2) \quad i^2 = -1$$

$$\begin{array}{l} x^2 - (-1) \\ x^2 + 1 \end{array}$$

$$(x^2-5x+6)(x^2+1)$$

$$x^4 - 5x^3 + 6x^2$$

$$x^2 - 5x + 6$$

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$$x^4 - 5x^3 + 7x^2 - 5x + 6$$

Find all of the zeros and write a linear factorization of the function.

$$f(x) = 3x^4 + 8x^3 + 6x^2 + 3x - 2 \quad -2 \quad \pm 1, \pm 2$$

$$3 \quad \pm 1, \pm 3$$

$$\begin{array}{r|rrrrr} -2 & 3 & 8 & 6 & 3 & -2 \\ & & -6 & -4 & -4 & 2 \\ \hline \frac{1}{3} & 3 & 2 & 2 & -1 & 0 \\ & & 1 & 1 & 1 & \\ \hline & 3 & 3 & 3 & 0 & \end{array}$$

$$x^2 + x + 1 = 0$$

$$-\frac{1}{2} \pm \frac{\sqrt{1^2 - 4(1)(1)}}{2}$$

$$-\frac{1}{2} \pm \frac{\sqrt{-3}}{2}$$

$$(x+2)\left(x-\frac{1}{3}\right)\left(x-\frac{1}{2}+\frac{\sqrt{3}}{2}i\right)\left(x-\frac{1}{2}-\frac{\sqrt{3}}{2}i\right)$$