Quiz Review

Evaluate each function at the given value.

1) $f(a) = 6a^4 - 30a^3 + 5a^2 - 29a + 22$ at $a = 5$

5 | 6 -30 5 -29 22
↓ 30 0 25 -20
6 0 5 -4 | 2

$f(5) = 2$

State the possible rational roots for each equation.

2) $5x^4 + 8x^2 + 3 = 0$

List: $\pm 1, \pm 3, \pm\frac{1}{5}, \pm\frac{3}{5}$

3: 1, 3
5: 1, 5

Find all rational zeros.

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

$\pm 1, \pm\frac{1}{3}$

1 | 3 -1 -3 1
↓ 3 2 -1
3 2 -1 0

$3x^2 + 2x - 1$
$3x^2 + 3x - 1x - 1$
$3x(x+1) - 1(x+1)$
$(3x-1)(x+1)$

$X = 1 \quad X = -1 \quad X = \frac{1}{3}$

$X+1=0$
$-1 \quad -1$

Write a polynomial function of least degree with integral coefficients that has the given zeros.

4) $-3, \_, 0, \_, 2$

$X = -3 \quad X = 0 \quad X = 2$
$X+3 \quad X \quad X-2$

$X(X+3)(X-2)$
$X^2 - 2X + 3X - 6$
$X(X^2 + X - 6)$

$3(-1) = -3$
Add = 2

$f(x) = X^3 + X^2 - 6X$

Write the equation

$x = 5i$

$x = -5i$

$x = -3 \quad x = \sqrt{2} \quad x = -\sqrt{2}$

$(x+3)(x-\sqrt{2})(x+\sqrt{2})$

$x^2 + x\sqrt{2} - x\sqrt{2} - 2$

$(x+3)(x^2-2) = x^3+3x^2-2x-6$

$$X = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$