Lesson 1.12 - 1.16 - Practice Quiz

1) Use long division to divide the following:

a. $(90r^3 + 145r^2 + 77r + 29) \div (9r + 10)$

$10r^2+5r+3$ R -1

$10r^2+5r+3-\frac{1}{9r+10}$

b. $(3b^3 - 14b^2 - 22b + 70) \div (3b + 7)$

b^2-7b+9 R 7

$b^2-7b+9+\frac{7}{3b+7}$

3) Describe how the remainder theorem helps us determine the points on a polynomial graph?

If you divide a polynomial by synthetic division, the number dividing by is the x coordinate and the remainder is the y coordinate

4) List all of the possible rational zeros for the following polynomials:

a. $f(x) = x^3 - 27$

$x = \pm 1, \pm 3, \pm 9, \pm 27$

b. $f(x) = 2x^4 - 9x^2 + 7$

$x = \frac{\pm 1, \pm 7}{\pm 1, \pm 2}$

$x = \pm 1, \pm 7, \pm\frac{1}{2}, \pm\frac{7}{2}$

c. $f(x) = 3x^4 - 10x^3 - 24x^2 - 6x + 5$

$x = \frac{\pm 1, \pm 5}{\pm 1, \pm 3}$

$x = \pm 1, \pm 5, \pm\frac{1}{3}, \pm\frac{5}{3}$

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5) Simplify the following complex expressions:

a. $-3+6i-(-5-3i)-8i$

$-3+6i+5+3i-8i$

$2-i$

b. $(7-6i)(-8+3i)$

$-56+21i+48i-18i^2$

$-56+69i+18$

$-38+69i$

c. $\dfrac{-3-7i}{7+10i}$

$\dfrac{-3-7i}{7+10i}\cdot\dfrac{7-10i}{7-10i}=\dfrac{-21+30i-49i+70i^2}{49-100i^2}\quad\dfrac{-21+79i+70}{149}$

$\dfrac{-91-19i}{149}$

d. $\dfrac{-10-5i}{-6+6i}\cdot\dfrac{-6-6i}{-6-6i}=\dfrac{60+60i+30i+30i^2}{36-36i^2}$

$=\dfrac{30+90i}{72}=\dfrac{5+15i}{12}$

6) Find the real zeros of the following polynomials:

a. $f(x)=3x^4-20x^3+26x^2-4x-5$

$x=1$ mult 2, 5, $-\frac{1}{3}$

b. $f(x)=6x^3+7x^2-1$

$x=-1,\ -\frac{1}{2},\ \frac{1}{3}$

c. $f(x)=2x^4-x^3-18x^2+9x$

$x=0,\ \frac{1}{2},\ 3,\ -3$

$x(2x^3-x^2-18x+9)$

$x(x^2(2x-1)-9(2x-1))$

$x(2x-1)(x^2-9)$

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