Algebra 3 Assignment # 6
Review Worksheet

(1) Find all roots of each of the following please.

(a) $6x^4 - x^3 - 55x^2 + 9x + 9 = 0$

(b) $4x^3 - 20x^2 - x + 5 = 0$

(c) $x^4 + 3x^3 + x^2 - 7x - 30 = 0$

(d) $x^4 + 2x^3 - 7x^2 + 62x + 52 = 0$, Given: $2 + 3i$ is a root

(e) $4x^5 - 4x^4 - 37x^3 + 37x^2 + 9x - 9 = 0$

(f) $x^5 + 6x^4 + 15x^3 + 26x^2 + 36x + 24 = 0$

(2) Write an integral polynomial having the following sets of roots please.

(a) $\left\{1, -\frac{2}{3}, \frac{3}{5}\right\}$

(b) $\left\{2 \pm \sqrt{5} \ , \ -3 \pm i\right\}$

(3) Find the remainder when the polynomial $7x^{103} - 5x^{53} + 6x^{16} - 4$ is divided by $(x - i)$.

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Answers

(1) **(a)** $\left\{ \pm 3 \, , \, \frac{1}{2} \, , \, -\frac{1}{3} \right\}$

(b) $\left\{ 5 \, , \, \pm \frac{1}{2} \right\}$

(c) $\left\{ -3 \, , \, 2 \, , \, -1 \pm 2i \right\}$

(d) $\left\{ 2 \pm 3i \, , \, -3 \pm \sqrt{5} \right\}$

(e) $1 \, , \, \pm \frac{1}{2} \, , \, \pm 3$

(f) $-2 \, , \, -2 \, , \, -2 \, , \, \pm \sqrt{3} \, i$

(2) **(a)** $15x^3 - 14x^2 - 7x + 6 = 0$

(b) $x^4 + 4x^3 - 6x^2 - 44x - 40 = 0$

(3) $2 - 12i$