

Quiz 3C, Precalculus-04

Dr. Graham-Squire, Fall 2013

Name: Key

1. (3 points) Completely factor the polynomial $P(x) = x^3 - 4x^2 + 5x$ into linear terms.

$$P(x) = x(x^2 - 4x + 5)$$

$$P(x) = x(x - (2+i))(x - (2-i))$$

$$x = \frac{4 \pm \sqrt{16 - 4(1)(5)}}{2}$$

$$x = \frac{4 \pm \sqrt{16 - 20}}{2}$$

$$x = \frac{4 \pm \sqrt{-4}}{2}$$

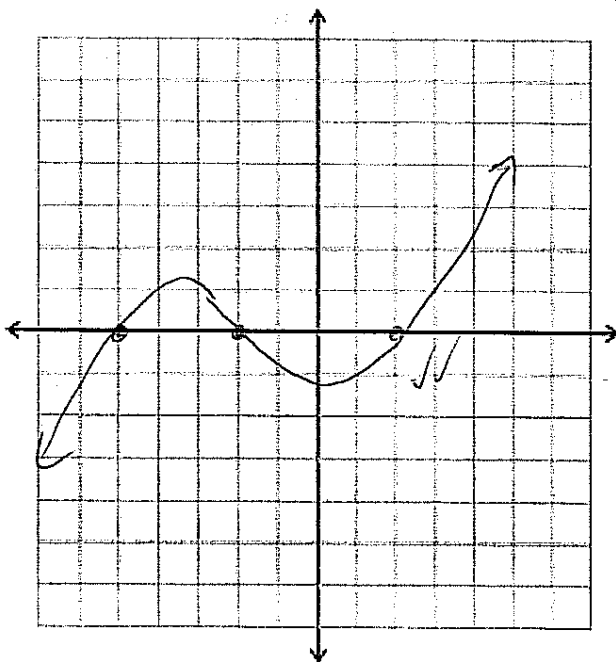
$$= \frac{4 \pm 2i}{2} = 2 \pm i$$

2. (4 points) Factor the polynomial $f(x) = (x^3 + 5x^2)(4x - 20)$ and use the factored form to sketch the graph.

$$= x^2(x+5) - 4(x+5)$$

$$= (x+5)(x^2 - 4)$$

$$= (x+5)(x-2)(x+2)$$



$$f(-6) = - \cdot - \cdot - = -$$

$$f(-3) = + \cdot - \cdot - = +$$

$$f(0) = + \cdot - \cdot + = -$$

$$f(3) = + \cdot + \cdot + = +$$

3. (3 points) Do polynomial long division (or synthetic division) to find the quotient and remainder for the expression

$$\frac{2x^3 - 4x^2 - 10x + 7}{x^2 - 3x + 2}$$

$$\begin{array}{r}
 \overline{) 2x^3 - 4x^2 - 10x + 7} \\
 \underline{-(2x^3 - 6x^2 + 4x)} \\
 2x^2 - 14x + 7 \\
 \underline{-(2x^2 - 6x + 4)} \\
 -8x + 3
 \end{array}$$

$2x + 2$ \checkmark \rightarrow Quotient
 $-8x + 3$ \checkmark \rightarrow Remainder

allow \uparrow mistake
 calculation.

Quiz 3D, Precalculus-04

Dr. Graham-Squire, Fall 2013

Name: Key

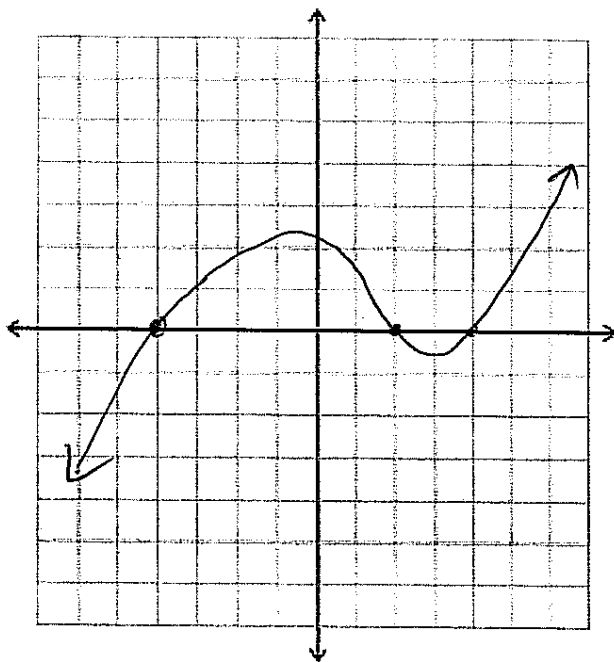
1. (3 points) Completely factor the polynomial $P(x) = x^3 - 6x^2 + 10x$ into linear terms.

$$P(x) = x(x^2 - 6x + 10)$$

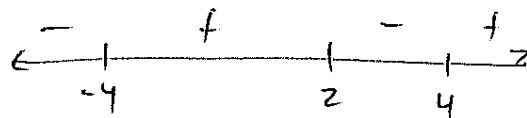
$$P(x) = x(x - (3+i))(x - (3-i))$$

$$\begin{aligned} & \frac{6 \pm \sqrt{(6)^2 - 4(1)(10)}}{2} \\ &= \frac{6 \pm \sqrt{-4}}{2} \\ &= \frac{6 \pm i\sqrt{4}}{2} \\ &= \frac{6 \pm 2i}{2} = \frac{(3 \pm i) \cdot 2}{2} \\ &= 3 \pm i \end{aligned}$$

2. (4 points) Factor the polynomial $f(x) = x^3 - 2x^2 - 16x + 32$ and use the factored form to sketch the graph.



$$\begin{aligned} f(x) &= (x^3 - 2x^2) - 16x + 32 \\ &= x^2(x-2) - 16(x-2) \\ &= (x^2 - 16)(x-2) \\ &= (x-4)(x+4)(x-2) \end{aligned}$$



$$\begin{aligned} f(-5) &= - \cdot - \cdot - = - \\ f(0) &= + \cdot + \cdot - = - \\ f(3) &= - \cdot + \cdot + = - \\ f(5) &= + \cdot + \cdot + = + \end{aligned}$$

3. (3 points) Do polynomial long division (or synthetic division) to find the quotient and remainder for the expression

$$\begin{array}{r}
 \frac{3x^3 - 4x^2 - 20x + 7}{x^2 + 2x + 3} \\
 \hline
 3x - 10 \quad \rightarrow \text{Quotient} \\
 \hline
 x^2 + 2x + 3 \overline{) 3x^3 - 4x^2 - 20x + 7} \\
 \underline{-(3x^3 + 6x^2 + 9x)} \\
 -10x^2 - 29x + 7 \\
 \underline{-(-10x^2 - 20x - 30)} \\
 -9x + 37 \quad \rightarrow \text{Remainder}
 \end{array}$$