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**Advanced Functions and Modeling Unit 10 Homework**

**Use the graphing calculator to find one real zero. Then use synthetic or long division to find the remaining zeros. (You may need the quadratic formula.) TO RECEIVE CREDIT YOU MUST SHOW YOUR WORK!**

1. $y=x^{3}-7x+6$ 2. $y=2x^{3}-5x^{2}+3x-2$

**Use the factored form of the polynomial to state the zeros, multiplicity of each zero, and if the graph touches or passes through at that zero.**

3. $f\left(x\right)=x\left(x-3\right)^{2}(x+4)^{3}$ 4. $f\left(x\right)=\left(3x-2\right)\left(x+1\right)^{2}(x-5)$

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| **Zero** | **Multiplicity** | **Touch/Cross** |  | **Zero** | **Multiplicity** | **Touch/Cross** |
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**Factor each polynomial. Then fill in the chart. You may not need all of the spaces in the chart.**

5. $f\left(x\right)=-3x^{3}-3x^{2}+60x$ 6. $f\left(x\right)=2x^{4}-18x^{2}$

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| **Zero** | **Multiplicity** | **Touch/Cross** |  | **Zero** | **Multiplicity** | **Touch/Cross** |
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**Advanced Functions and Modeling Unit 10 Homework 2**

**Use the graphing calculator to find one real zero. Then use synthetic or long division to find the remaining zeros. (You may need the quadratic formula.) TO RECEIVE CREDIT YOU MUST SHOW YOUR WORK!**

1. $y=x^{3}-7x+6$ 2. $y=2x^{3}-5x^{2}+3x-2$

**Use the factored form of the polynomial to state the zeros, multiplicity of each zero, and if the graph touches or passes through at that zero.**

3. $f\left(x\right)=x\left(x-3\right)^{2}(x+4)^{3}$ 4. $f\left(x\right)=\left(3x-2\right)\left(x+1\right)^{2}(x-5)$

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| **Zero** | **Multiplicity** | **Touch/Cross** |  | **Zero** | **Multiplicity** | **Touch/Cross** |
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**Factor each polynomial. Then fill in the chart. You may not need all of the spaces in the chart.**

5. $f\left(x\right)=-3x^{3}-3x^{2}+60x$ 6. $f\left(x\right)=2x^{4}-18x^{2}$

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| **Zero** | **Multiplicity** | **Touch/Cross** |  | **Zero** | **Multiplicity** | **Touch/Cross** |
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