Math 3: 4.5 Graphing Polynomial Functions

**Solve for x.**

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**Factor each polynomial.**

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**Without graphing, tell the end behavior of the function.**

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| as *x → +* ∞, *f(x)* → \_\_\_\_\_\_  as *x* → − ∞, *f(x)* → \_\_\_\_\_\_ | as *x → +* ∞, *f(x)* → \_\_\_\_\_\_  as *x* → − ∞, *f(x)* → \_\_\_\_\_\_ |
| as *x → +* ∞, *f(x)* → \_\_\_\_\_\_  as *x* → − ∞, *f(x)* → \_\_\_\_\_\_ | as *x* → − ∞, *f(x)* → \_\_\_\_\_\_  as *x → +* ∞, *f(x)* → \_\_\_\_\_\_ |

**Tell each zero of the function. Include multiplicities if applicable.**

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**Write an equation in standard form for the cubic function.**

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| (0, -12) | 1. x-intercepts: 7, 2, -5; y-intercept: 10 |

**The graph a quartic polynomial equation is shown. Graph the transformations requested.**

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**State the number of complex roots and the number of real roots for each function shown.**

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| 1. 4th degree polynomial:   # Complex Roots: \_\_\_\_  # Real Roots: \_\_\_\_  # Non-Real Roots: \_\_\_\_ | 1. 3rd degree polynomial:     # Complex Roots: \_\_\_\_  # Real Roots: \_\_\_\_  # Non-Real Roots: \_\_\_\_ | 1. 5th degree polynomial:     # Complex Roots: \_\_\_\_  # Real Roots: \_\_\_\_  # Non-Real Roots: \_\_\_\_ | 1. 3rd degree polynomial:     # Complex Roots: \_\_\_\_  # Real Roots: \_\_\_\_  # Non-Real Roots: \_\_\_\_ |

**Graph each function. Be sure to indicate the value of the y-intercept on the graph.** (use end behavior, zeros, multiplicities…)

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| **Select Answers:** **1)** ; **2)** ; **3)** ; **4)** ; **5)** ; **6)** ;  **7)** ; **8)**; **9)** ; **10)** ; **11)** +∞, -∞; **12)** -∞, -∞;  **13**) -∞, +∞; **14)** +∞, +∞; **15)** -3, 2 (mult. 2); **16)** 0, 4, 8, -2; **17)** 7 (mult 4), -5 (mult 2); **18)**;  **19)**; **22)** cmplx:4, real: 2, non-real: 2; **23)** cmplx:3, real: 3, non-real: 0; **24)** cmplx: 5, real: 3, nonreal 2; **25)** cmplx:3, real: 3, non-real: 0; |  |  |