

Factoring and Solving Higher Order Polynomial Worksheet

Factor Completely:

1. $64x^3 + xy^3$

2. $w^3 - 8y^3$

Solve Completely (Remember, once you get to a 2nd power polynomial/Quadratic, you have factoring, square root property, and quadratic formula to utilize):

3. $x^4 + x^2 - 90 = 0$

4. $64x^3 + 1 = 0$

5. $27x^3 - 1000 = 0$

6. $x^4 - 625 = 0$

7. $x^4 + 6x^2 + 5 = 0$

8. Tricky 😊: $x^6 - 26x^3 - 27 = 0$

Calculator Exercises:

9. Using your calculator, find all *real* solutions of: $\frac{1}{2}x^5 - \frac{1}{5}x^2 = -2$. Use BOTH methods of solving polynomials on your calculator. Verify that both methods give you the same answer(s).

10. The table shows how many minutes out of each eight-hour workday are used to pay one day's worth of taxes.

- Draw a scatter plot of the data (include a rough sketch on your paper)
- Graph several models (Linear, Quadratic, Cubic).
- Write the model equation for the curve that best fits the data.
- Based on this equation, how many minutes should you expect to work each day in the year 2020 to pay one day's taxes?

YEAR	MINUTES
2003	136
2004	137
2005	145
2006	150
2007	149
2008	139
2009	128
2010	129
2011	133

11. Divide using *Long Division*: $\frac{6x^5+5x^4+x^3-3x^2+x}{3x+1}$

12. Diving using *Synthetic Division*: $(z^4 - 3z^3 + 2z^2 - 4z + 4) \div (z - 1)$