Chapter 6 Review
Review must be turned in to be eligible for retest. Show ALL work on separate sheet of paper!!

#1 – 2. Classify each polynomial by degree and number of terms. (p. 313 Ex. 1)
1. $-3x^5 - 2x^3$
2. $7x^5 - 9x^3 - 6x^2 + 8$

3. Write $-4x^2(3x^2 + x^3)$ in standard form. Then classify it by degree and number of terms. (p. 313 Ex. 1)

4. Zach wrote the formula $w(w - 1)(4w + 6)$ for the volume of a rectangular prism he is designing, with width $w$, which is always has a positive value greater than 1. Find the product and then classify this polynomial by degree and by number of terms. (p. 313 Ex. 1)

5. The table shows the number of hybrid cottonwood trees planted in tree farms in Oregon since 1995. Find a cubic function to model the data and use it to estimate the number of cottonwoods planted in 2007. (p. 314 Ex. 3)

<table>
<thead>
<tr>
<th>Years since 1995</th>
<th>1</th>
<th>3</th>
<th>5</th>
<th>7</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trees planted (in thousands)</td>
<td>1.3</td>
<td>18.3</td>
<td>70.5</td>
<td>177.1</td>
<td>357.3</td>
</tr>
</tbody>
</table>

#6 – 7. Factor. (Remember to first look for a GCF!) (p. 320 Ex. 2)
6. $5x^3 + 0x^2 - 45x$  
7. $6x^3 + 42x^2 + 60x$

8. Write a polynomial function in standard form with zeros at 3, –5, and –2. (p. 322 Ex. 5)

9. Find the zeros of $y = x(x + 4)(x - 3)$. Then sketch the graph of the equation. (p. 321 Ex. 4)

#10 – 12. Divide using synthetic division or long division. (You need to know how to do both for the test!) Determine whether the binomial is a factor of the polynomial. (p. 327 Ex. 1 & 3, p. 328 Ex 3)
10. $(x^4 + 20x^3 + 74x^2 + 31x - 36) / (x + 4)$
11. $(x^3 + 3x^2 - 11x + 4) / (x + 6)$
12. $-4x^3 - 2x^2 - x - 3$ by $x - 4$.

13. Use synthetic division to find $P(3)$ for $P(x) = x^4 - 8x^3 - 9x^2 + 7x - 7$. (p. 329 Ex. 5)

#14 – 17. Solve by factoring. (p. 335 Ex. 4, p. 336 Ex. 6)
14. $x^3 + 8 = 0$
15. $c^3 - 27 = 0$
16. $x^4 - 45x^2 = -324$
17. $x^4 - 25x^2 + 144 = 0$.

#18 – 19. Use the rational root theorem to list all possible rational roots of the polynomial equation. Do NOT find any actual roots. (p. 342 Ex. 1)
18. $x^3 + 7x^2 - 8x + 9 = 0$
19. $2x^3 + 3x^2 - 4x - 10 = 0$

#20 – 21. Find the rational roots of the polynomial equation. (p. 342 Ex. 1)
20. $2x^3 + 3x^2 + x + 30 = 0$
21. $x^4 + 8x^3 + 7x^2 - 40x - 60 = 0$

#22 – 23. Find ALL of the roots of the polynomial equation. (p. 342 Ex. 2)
22. $x^3 - 7x^2 + 20x - 24 = 0$
23. $2x^3 + 9x^2 + 5x - 12 = 0$

#24 – 25. A polynomial equation has the following roots. Find two additional roots. (p. 343 Ex. 3 & 4)
24. $7 + \sqrt{1,7 - \sqrt{7}}$
25. $1 + \sqrt{2}, 5 - \sqrt{7}$

#26 – 27. For the equation, find the number of complex roots, the possible number of real roots, and the possible rational roots. (p. 348 Ex. 1)
26. $x^7 - 2x^6 + 3x^2 - 2x + 5 = 0$
27. $2x^4 + 7x^3 - 5x + 12 = 0$