## 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. $-3 x^{5}-2 x^{3}$
2. $7 x^{5}-9 x^{4}-6 x^{2}+8$
3. Write $-4 x^{2}\left(3 x^{2}+x^{3}\right)$ in standard form. Then classify it by degree and number of terms. (p. 313 Ex. 1)
4. Zach wrote the formula $w(w-1)(4 w+6)$ 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. $313 \mathrm{Ex.1}$ )
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)

| Years since 1995 | 1 | 3 | 5 | 7 | 9 |
| :--- | :---: | :---: | :---: | :---: | :---: |
| Trees planted (in thousands) | 1.3 | 18.3 | 70.5 | 177.1 | 357.3 |

\#6 - 7. Factor. (Remember to first look for a GCF!) (p. 320 Ex. 2)
6. $5 x^{3}+0 x^{2}-45 x$
7. $6 x^{3}+42 x^{2}+60 x$
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 .123, p. 328 Ex 3 )
10. $\left(x^{4}+20 x^{3}+74 x^{2}+31 x-36\right) \div(x+4)$
11. $\left(x^{3}+3 x^{2}-11 x+4\right) \div(x+6)$
12. $-4 x^{3}-2 x^{2}-x-3$ by $x-4$.
13. Use synthetic division to find $P(3)$ for $P(x)=x^{4}-8 x^{3}-9 x^{2}+7 x-7$. (p.329Ex. 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. $x^{4}-45 x^{2}=-324$.
17. $x^{4}-25 x^{2}+144=0$.
\#18 - 19. Use the rational root theorem to list all possible rational roots of the polynomial equation. Do NOT find any actual roots. (p. $342 \mathrm{Ex}$. 1)
18. $x^{3}+7 x^{2}-8 x+9=0$
19. $2 x^{3}+3 x^{2}-4 x-10=0$
\#20 - 21. Find the rational roots of the polynomial equation. (p. 342 Ex .1 )
20.
$2 x^{3}+3 x^{2}+x+30=0$
21. $x^{4}+8 x^{3}+7 x^{2}-40 x-60=0$
\#22 - 23. Find ALL of the roots of the polynomial equation. (p. 342 Ex .2 )
22. $x^{3}-7 x^{2}+20 x-24=0$
23. $2 x^{3}+9 x^{2}+5 x-12=0$
\#24-25. A polynomial equation has the following roots. Find two additional roots. (p. 343 Ex. 384 )
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. $348 \mathrm{Ex}$. 1)
26. $x^{7}-2 x^{6}+3 x^{2}-2 x+5=0$
27. $2 x^{4}+7 x^{2}-5 x+12=0$

