**Chapter 6 Practice Test**

1. Perform the operation. *(2 points each)*
	1. $\left(5a^{2}-7ab+3b^{2}\right)+\left(6a^{2}+ab-6b^{2}\right)$

$$11a^{2}-6ab-3b^{2}$$

* 1. $\left(7x^{3}+ 4x^{2}+5\right)-(5x^{2}-2x+1)$

$$7x^{3}-x^{2}+2x+4$$

1. Let *f(t)* and *g(t)* be the market shares of chardonnay and zinfandel wines, respectively, at *t* years since 1990. Reasonable models are:

$$f\left(t\right)= -0.071t^{2}+2.17t+20.58$$

$$g\left(t\right)= -0.92t+32.83$$

1. Find an equation of the sum function $(f+g)$. *(1 point)*

$$\left(f+g\right)= -.071t^{2}+1.25+53.41$$

1. Find $(f+g)(13)$. What does it mean in this situation? *(2 points)*

$$\left(f+g\right)\left(13\right)=57.661;In 2003, combined shares were 57.661$$

1. Find an equation of the difference function $(f-g)$. *(1 point)*

$$\left(f-g\right)= -.071t^{2}+3.09t-12.25$$

1. Find $(f-g)(13)$. What does it mean in this situation? *(2 points)*

$$\left(f-g\right)\left(13\right)=15.921;In 2003, Chardonnay market shares were 15.921 more than Zinfandel$$

1. Write the quadratic function $f\left(x\right)=(x-3)^{2}-(x+3)^{2}$ in standard form. *(4 points)*

$$f\left(x\right)= -12x$$

1. Find the product. *(3 points each)*
	1. $4a^{2}b(3a^{2}-2ab+7b^{2})$ d. $\left(4x-2\right)\left(3x^{2}+2x-1\right)$

$$12a^{4}b-8a^{3}b^{2}+28a^{2}b^{3} 12x^{3}+2x^{2}-8x+2$$

* 1. $\left(3m+7n\right)\left(2m-5n\right)$ e. $(x^{4}-5)(x^{3}+2)$

$$6m^{2}-mn-35n^{2} x^{7}+2x^{4}-5x^{3}-10$$

* 1. $(3r^{2}- 5t^{2})(3r^{2}+ 5t^{2})$

$$ 9r^{4}-25t^{4}$$

1. For $f\left(x\right)=2x^{2}-x+3$ and $g(x)=3x^{2}+2x-4$, find an equation of the product function $f · g$. *(2 points)*

$$\left(f·g\right)=6x^{4}+x^{3}-x^{2}+10x-12$$

1. Factor. *(3 points each)*
	1. $x^{2}-4x-60$ e. $64a^{3}-27$

$$\left(x-10\right)\left(x+6\right) (4a-3)(16a^{2}+12a+9)$$

* 1. $6p^{2}-11pq-10q^{2}$ f. $-3x^{2}+24x-45$

$$\left(3p+2q\right)\left(2p-5q\right) -3(x-5)(x-3)$$

* 1. $25x^{2}-4y^{2}$ g. $2a^{4}b-8a^{3}b^{2}-10a^{2}b^{3}$

$$\left(5x-2y\right)\left(5x+2y\right) 2a^{2}b(a-5b)(a+b)$$

* 1. $x^{3}-5x^{2}-9x+45$ $(x-5)(x+3)(x-3)$
1. Solve. *(4 points each)*
	1. $x^{2}=5x$ d. $2w(4w + 1) = 3$

$x=0 or x=5$ $w= -\frac{3}{4} or w=\frac{1}{2}$

* 1. $p^{2}-7p= -10$ e. $4x-3x^{2}=x^{3}-12$

$p=5 or p=2$ $x= -2 or x=2 or x= -3$

* 1. $\frac{1}{4}x^{2}+\frac{1}{2}x=\frac{3}{4}$

$$x=0 or x= -4 or x=1$$

1. Find the $x$-intercepts of the graph of the function $g\left(x\right)=5x^{3}+15x^{2}-20x$. *(2 points)*

$$\left(0, 0\right), \left(-4, 0\right), and (1, 0)$$

1. A rectangular rug has an area of 54 square feet. If its length is 3 feet less than twice its width, find the dimensions of the rug. *(2 points)*

$$dimensions are 6ft and 9 ft$$

1. Let $f(t)$ be the number of bookmobiles at $t$ years since 1998. A reasonable model is $f\left(t\right)=4t^{2}-31t+933. $
	1. Estimate when there were 878 bookmobiles. *(2 points)*

$$There were 878 bookmobiles in 2000 and 2003$$

* 1. Predict the total number of bookmobiles in the year 2018. *(1 point)*

 $There will be 1,913 bookmobiles in 2018$