Midterm Review – Chapter 6
Class Review
Honors Algebra 2

Name Key 2014-15

Hour_____ Date_____

Simplify completely.

Together:

1. $2\sqrt[3]{8x^5} + \sqrt[3]{27x^2}$

$= 2\sqrt[3]{8 \cdot x^3 \cdot x^2} + \sqrt[3]{27 \cdot x^2}$

$= 4x\sqrt[3]{x^2} + 3\sqrt[3]{x^2}$

$= (4x+3)\sqrt[3]{x^2}$

3. $-4\sqrt[3]{32} \cdot 2\sqrt[3]{4}$

$= -8\sqrt[3]{32 \cdot 4}$

$= -8\sqrt[3]{8 \cdot 4 \cdot 2}$

$= -32\sqrt[3]{2}$

5. $4x^3y^6 + (2x^2y^3)^2 - x^3y^6$

$= 4x^3y^6 + 4x^4y^6 - x^3y^6$

$= 3x^3y^6 + 4x^4y^6$

7. $\frac{4\pi^5}{2\pi^2} = 2\pi^3$

9. $\left(\frac{x^{-3}y^5}{x}\right)^2 = \frac{x^{-6}y^{10}}{x^2}$

$= \frac{y^{10}}{x^8}$

Practice:

2. $7\sqrt{25x^3} - 3\sqrt[3]{9x}$

$= 7\sqrt{5^2 \cdot 5 \cdot x} - 3\sqrt[3]{3^2 \cdot x}$

$= 35x\sqrt{x} - 9x\sqrt{x}$

$= 26x\sqrt{x}$

4. $7\sqrt[4]{25} \cdot -3\sqrt[4]{125}$

$= -21\sqrt[4]{25 \cdot 125}$

$= -21\sqrt[4]{5^4 \cdot 5}$

$= -105\sqrt[4]{5}$

6. $(7x^2y)^3 - 3x^6y^3 + 2xy^3$

$= 343x^6y^3 - 3x^6y^3 + 2xy^3$

$= 340x^6y^3 + 2xy^3$

8. $\frac{-16e^9}{4e^3} = -4e^6$

10. $\left(\frac{2x^3}{y^{-3}}\right)^3 = \frac{8x^9}{y^{-9}}$

$= 8x^9y^9$

Solve.

Together:

11. $\sqrt[3]{x-5}=4$

$x-5=64$

$x=69$

12. $\sqrt{2x-5}=3$

$2x-5=9$

$2x=14$

$x=7$

13. $\sqrt{3x+7}=(x+1)^2$

$3x+7=x^2+2x+1$

$0=x^2-x-6$

$0=(x-3)(x+2)$

$x=3,-2$

14. $\sqrt[3]{x+5}+2=7$

$\sqrt[3]{x+5}^3=5^3$

$x+5=125$

$x=120$

15. $(x-2)^{1/3}-3=-5$

$(x-2)^{1/3}=-2$

$x-2=-8$

$x=-6$

16. $2x^{\frac{1}{2}}=96$

$x^{1/2}=48$

$x=2,304$

For #17-20, let $f(x)=2x^2+3x-1,\ g(x)=x+4$

17. Find $g(f(2))$

$=g(2(2)^2+3(2)-1)$

$=g(13)$

$=13+4=17$

18. Find $f(g(-3))$

$=f(-3+4)$

$=f(1)$

$=2(1)^2+3(1)-1=4$

19. Evaluate $f(x)+g(x)$

$=(2x^2+3x-1)+(x+4)$

$=2x^2+4x+3$

20. Evaluate $g(x)-f(x)$

$=(x+4)-(2x^2+3x-1)$

$=-2x^2-2x+5$

For #21-22, find the inverse of the given function.

21. $f(x)=4x^7$

$x=4y^7$

$\frac{x}{4}=y^7$

$\sqrt[7]{\frac{x}{4}}=y$

$f^{-1}(x)=\sqrt[7]{\frac{x}{4}}$

22. $f(x)=3-2x$

$x=3-2y$

$x-3=-2y$

$\frac{x-3}{-2}=y$

$f^{-1}(x)=-\frac{1}{2}x+\frac{3}{2}$

Midterm Review – Chapter 6
Practice Time
Honors Algebra 2

Name_____

Hour_____ Date_____

Simplify Completely.

1. $\sqrt[3]{125}\cdot\sqrt[3]{8}$

$= \sqrt[3]{5^3 2^3}$

$= 10$

2. $\dfrac{x^{2/5}y}{xy^{-1/3}}$

$= x^{2/5-5/5}\cdot y^{3/3-(-1/3)}$

$= x^{-3/5}y^{4/3}$

$= \dfrac{y^{4/3}}{x^{3/5}}$

3. $10\sqrt[4]{5x^7} - x\sqrt[4]{80x^3}$

$= 10\sqrt[4]{5\cdot x^4\cdot x^3} - x\sqrt[4]{2^4\cdot 5\cdot x^3}$

$= 10x\sqrt[4]{5x^3} - 2x\sqrt[4]{5x^3}$

$= 8x\sqrt[4]{5x^3}$

4. $12^{1/8}\cdot 12^{5/6}$

$= 12^{1/8+5/6}$

$= 12^{6/48+40/48}$

$= 12^{46/48} = 12^{23/24}$

5. $3x^3y^{12} - (xy^4)^3$

$= 3x^3y^{12} - x^3y^{12}$

$= 2x^3y^{12}$

6. $(x^2y^{1/3})^{2/5}$

$= x^{4/5}y^{2/15}$

7. Let $f(x) = 5x^{1/3}$ *and* $g(x) = -11x^{1/3}$. Find the following.

a. $f(x) + g(x)$

$= (5x^{1/3}) + (-11x^{1/3})$

$= -6x^{1/3}$

b. $f(x) - g(x)$

$= (5x^{1/3}) - (-11x^{1/3})$

$= 16x^{1/3}$

8. Let $f(x) = 8x$ *and* $g(x) = 2x^{5/6}$. Find the following.

a. $f(x)\cdot g(x)$

$= 8x\cdot 2x^{5/6}$

$= 16x^{11/6}$

b. $\dfrac{f(x)}{g(x)}$

$= \dfrac{8x^{6/6}}{2x^{5/6}}$

$= 4x^{1/6}$

9. Let $f(x)=x-7$, $g(x)=x^2-4x-21$, *and* $h(x)=x+3$. Find the following.

a. $f(x)\cdot g(x)$

$=(x-7)(x^2-4x-21)$

$=x^3-4x^2-21x-7x^2+28x+147$

$=x^3-11x^2+7x+147$

b. $\dfrac{f(x)}{g(x)}$ $=\dfrac{(x-7)}{x^2-4x-21}$

$=\dfrac{(x-7)}{(x-7)(x+3)}=\dfrac{1}{x+3}$

10. Let $f(x)=6x^{-2}$ *and* $g(x)=4x+5$. Find the following.

a. $f(g(x))$

$=f(4x+5)$

$=6(4x+5)^{-2}$

$=\dfrac{6}{(4x+5)^2}$

b. $[g\circ f](x)$ $=g(6x^{-2})$

$=4(6x^{-2})+5$

$=\dfrac{24}{x^2}+5$

11. Find $f^{-1}(x)$ for each of the following functions.

a. $f(x)=\dfrac{x-5}{3}$

$x=\dfrac{y-5}{3}$

$3x=y-5$

$3x+5=y$

$f^{-1}(x)=3x+5$

b. ~~$f(x)=x^2+6x-12$~~ $f(x)=\sqrt[3]{x-4}$

$x=\sqrt[3]{y-4}$

$x^3=y-4$

$x^3+4=y$

$f^{-1}(x)=x^3+4$

Solve and then check your solution.

12. $\sqrt{x}=6$

$x=36$ ✓

13. $\sqrt{x}+3=7$

$\sqrt{x}=4$

$x=16$ ✓

14. $4\sqrt[3]{x-6}=6$

$\sqrt[3]{x-6}=(6/4)^3$

$x-6=\dfrac{27}{8}$

$x=\dfrac{75}{8}$ ✓

15. $\sqrt[3]{x}-2=1$

$\sqrt[3]{x}=3$

$x=27$ ✓

Midterm Review – Chapter 6
Summative Ticket - VA
Honors Algebra 2

Name_____

Hour_____ Date_____

Simplify Completely. (1 pt each)

1. $4\sqrt[3]{9} \bullet -\sqrt[3]{6}$

$= -4\sqrt[3]{3^3 \cdot 2}$

$= -12\sqrt[3]{2}$

2. $(5x^3y)^3 - 12x^9y^3$

$= 125x^9y^3 - 12x^9y^3$

$= 113x^9y^3$

Solve. (1 pt each)

3. $\sqrt{x+2} = 3$

$x+2 = 9$

$x = 7$

4. $x = \sqrt{3x+4}$

$x^2 = 3x+4$

$x^2 - 3x - 4 = 0$

$(x-4)(x+1) = 0$

$x = 4, -1$

Midterm Review – Chapter 6
Summative Ticket - VA
Honors Algebra 2

Name_____

Hour_____ Date_____

Simplify Completely. (1 pt each)

1. $4\sqrt[3]{9} \bullet -\sqrt[3]{6}$

2. $(5x^3y)^3 - 12x^9y^3$

Solve. (1 pt each)

3. $\sqrt{x+2} = 3$

4. $x = \sqrt{3x+4}$

5. Find the inverse of $f(x) = 2x^4$. (1 pt)

$x = 2y^4$

$\frac{x}{2} = y^4$

$\pm\sqrt[4]{\frac{x}{2}} = y$

$f^{-1}(x) = \pm\sqrt[4]{\frac{x}{2}}$

Let $f(x) = x + 7$, $g(x) = x^2 + 3x - 1$. (1 pt each)

6. Evaluate $f(x) - g(x)$

$= (x+7) - (x^2+3x-1)$

$= -x^2 - 2x + 8$

7. $g(f(2))$

$= g(2+7)$

$= g(9)$

$= (9)^2 + 3(9) - 1$

$= 107$

5. Find the inverse of $f(x) = 2x^4$. (1 pt)

Let $f(x) = x + 7$, $g(x) = x^2 + 3x - 1$. (1 pt each)

6. Evaluate $f(x) - g(x)$

7. $g(f(2))$

Midterm Review – Chapter 6
Summative Ticket - VB
Honors Algebra 2

Name_____

Hour_____ Date_____

1. Find the inverse of $f(x) = 2x^4$. (1 pt)

Let $f(x) = x + 7,\ g(x) = x^2 + 3x - 1$. (1 pt each)

2. Evaluate $f(x) - g(x)$

3. $g(f(2))$

Midterm Review – Chapter 6
Summative Ticket - VB
Honors Algebra 2

Name_____

Hour_____ Date_____

1. Find the inverse of $f(x) = 2x^4$. (1 pt)

Let $f(x) = x + 7,\ g(x) = x^2 + 3x - 1$. (1 pt each)

2. Evaluate $f(x) - g(x)$

3. $g(f(2))$

Simplify Completely. (1 pt each)

4. $4\sqrt[3]{9} \bullet -\sqrt[3]{6}$

5. $\left(5x^3y\right)^3 - 12x^9y^3$

Solve. (1 pt each)

6. $\sqrt{x+2} = 3$

7. $x = \sqrt{3x+4}$

Simplify Completely. (1 pt each)

4. $4\sqrt[3]{9} \bullet -\sqrt[3]{6}$

5. $\left(5x^3y\right)^3 - 12x^9y^3$

Solve. (1 pt each)

6. $\sqrt{x+2} = 3$

7. $x = \sqrt{3x+4}$