Name Schlansky
Mr. Schlansky

Date _____
Pre Calculus

Radicals/Complex Numbers Review Sheet

For #1-8, express in simplest radical form

1. $-2\sqrt{8xy^3} \cdot 4\sqrt{6x^4y^2}$ multiply/divide first

$-8\sqrt{48x^5y^5}$

$-8\sqrt{16x^4y^4}\ \sqrt{3xy}$

$-8(4x^2y^2)\sqrt{3xy}$

$-32x^2y^2\sqrt{3xy}$

2. $2y^2\sqrt[3]{25y^6} \cdot xy\sqrt[3]{10x^5y^3}$

$2xy^3\sqrt[3]{250x^5y^9}$

$2xy^3\sqrt[3]{125x^3y^9}\ \sqrt[3]{2x^2}$

$2xy^3(5xy^3)\sqrt[3]{2x^2}$

$10x^2y^6\sqrt[3]{2x^2}$

3. $\dfrac{10\sqrt{250x^4y^5z^2}}{2\sqrt{5xyz}}$

$5\sqrt{50x^3y^4z}$

$5\sqrt{25x^2y^4}\ \sqrt{2xz}$

$5(5xy^2)\sqrt{2xz}$

$25xy^2\sqrt{2xz}$

4. $\dfrac{20xy^4\sqrt[3]{48x^8y^{12}}}{4x\sqrt[3]{3x^2y^3}}$

$5y^4\sqrt[3]{16x^6y^9}$

$5y^4\sqrt[3]{8x^6y^9}\ \sqrt[3]{2}$

$5y^4(2x^2y^3)\sqrt[3]{2}$

$10x^2y^7\sqrt[3]{2}$

5. $\sqrt{200k} - 2\sqrt{18k}$

$\sqrt{100}\sqrt{2k}\ \ 2\sqrt{9}\sqrt{2k}$

$10\sqrt{2k} - 2(3)\sqrt{2k}$

$10\sqrt{2k} - 6\sqrt{2k}$

$4\sqrt{2k}$

6. $5\sqrt[3]{16x} + 2\sqrt[3]{250x}$

$5\sqrt[3]{8}\ \sqrt[3]{2x}\ \ 2\sqrt[3]{125}\ \sqrt[3]{2x}$

$5(2)\sqrt[3]{2x} + 2(5)\sqrt[3]{2x}$

$10\sqrt[3]{2x} + 10\sqrt[3]{2x}$

$20\sqrt[3]{2x}$

7. $\frac{10}{6-\sqrt{3}}\cdot\frac{(6+\sqrt{3})}{(6+\sqrt{3})}$

$\frac{10(6+\sqrt{3})}{36-3}$

$\frac{60+10\sqrt{3}}{33}$

8. $\frac{-4}{2+\sqrt{10}}\cdot\frac{(2-\sqrt{10})}{(2-\sqrt{10})}$

$\frac{-8+4\sqrt{10}}{2-10}$

$\frac{\div 4}{-8+4\sqrt{10}}$

$\frac{\div -4}{2-\sqrt{10}}$

$\frac{2-\sqrt{10}}{2}$

For #9-10, solve for x

9. $x=1+\sqrt{x+5}$

$-1\ -1$

$(x-1)^2=(\sqrt{x+5})^2$

$(x-1)(x-1)=x+5$

$x^2-1x-1x+1=x+5$

$x^2-2x+1=x+5$

$-x-5\ \ -x-5$

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

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

$x=4$ | $x=-1$ reject

10. $3=-x+\sqrt{x+5}$

$+x\ \ +x$

$(x+3)^2=(\sqrt{x+5})^2$

$(x+3)(x+3)=x+5$

$x^2+3x+3x+9=x+5$

$x^2+6x+9=x+5$

$-x-5\ \ -x-5$

$x^2+5x+4=0$

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

$x=-4$ reject | $x=-1$

i^1 .0
i .25
-1 .50
$-i$ .75

For #11-14, express in simplest $a + bi$ form

11. $5i^3(6i^7 - 3i^{17})$

$30i^{10} - 15i^{20}$

$\frac{20}{4} = 5.0$ (1)

$\frac{10}{4}$

2.5

(-1)

$30(-1) - 15(1)$

$-30 - 15$

$-45 + 0i$

12. $-2i^9(3i^3 + 4i^{12})$

$-6i^{12} - 8i^{21}$

$\frac{12}{4} = 3.0$ (1)

$\frac{21}{4} = 5.25$ (i)

$-6(1) - 8(i)$

$-6 - 8i$

13. $\frac{7-2i}{5-i}$

$\frac{(7-2i)(5+i)}{(5-i)(5+i)}$

$\frac{35+7i-10i-2i^2}{25-i^2}$

$\frac{35-3i-2(-1)}{25-(-1)}$

$\frac{35-3i+2}{25+1}$

$\frac{37-3i}{26}$

$\frac{37}{26} - \frac{3}{26}i$

14. $\frac{6+2i}{-2-7i}$

$\frac{(6+2i)(-2+7i)}{(-2-7i)(-2+7i)}$

$\frac{-12+42i-4i+14i^2}{4-49i^2}$

$\frac{-12+38i+14(-1)}{4-49(-1)}$

$\frac{-12+38i-14}{4+49}$

$\frac{-26+38i}{53}$

$-\frac{26}{53} + \frac{38}{53}i$

For #15-16, graph each complex number, find an magnitude of the resultant.

15. $(-2 + \sqrt{-49})$ and $(3 - \sqrt{-16})$

$-2+7i$ $3-4i$

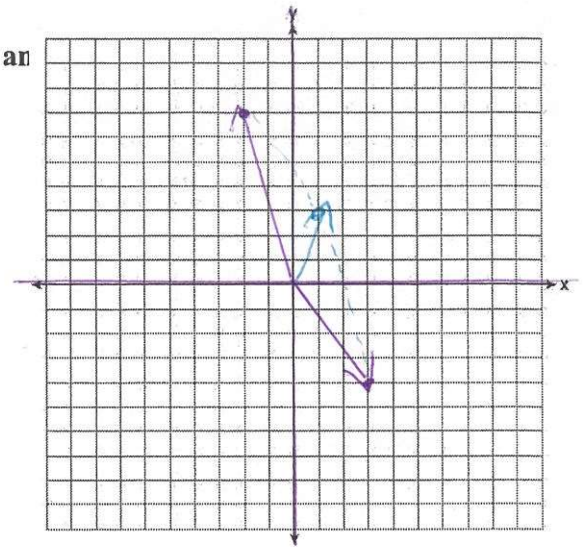
$(-2,7)$ $(3,-4)$

$-2+7i+3-4i$ resultant

$1+3i$

$\sqrt{1^2+3^2}$

$\sqrt{1+9} = \sqrt{10}$ magnitude of resultant



16. $(7 - 4i)$ and $(-5 + 7i)$

$(7,-4)$ $(-5,7)$

$7-4i+-5+7i$ resultant

$2+3i$

$\sqrt{2^2+3^2}$

$\sqrt{4+9} = \sqrt{13}$ magnitude of resultant