Review

Radicals and Complex Numbers

Name-_____ Date-_____

Simplify. No decimals! Each question is worth 3pts.

1. $\sqrt{300}$

$\sqrt{100}\cdot\sqrt{3}$

$10\sqrt{3}$

2. $\sqrt{48b^3}$

$\sqrt{16}\sqrt{3}$

$4b\sqrt{3b}$

3. $\sqrt{72x^4y^8}$

$\sqrt{36}\cdot\sqrt{2}$

$6\sqrt{2}$

$6x^2y^4\sqrt{2}$

4. $-\sqrt{150x^3y^6}$

$\sqrt{25}\sqrt{6}$

$-5xy^3\sqrt{6x}$

$\sqrt{x^3}$

5. $\sqrt{20}+\sqrt{5}-\sqrt{50}$

$\sqrt{4}\sqrt{5}$ $\sqrt{25}\sqrt{2}$

$2\sqrt{5}+\sqrt{5}-5\sqrt{2}$

$3\sqrt{5}-5\sqrt{2}$

6. $\sqrt{25}+\sqrt{27}-\sqrt{48}$

$\sqrt{16}\sqrt{3}$

$5\ \sqrt{9}\sqrt{3}$

$5+3\sqrt{3}-4\sqrt{3}$

$5-1\sqrt{3}$

7. $5\sqrt{2}\cdot 3\sqrt{6}$

$15\sqrt{12}$

$\sqrt{4}\sqrt{3}$

$2\sqrt{3}$

$30\sqrt{3}$

8. $3\sqrt{2}\left(5\sqrt{6}+2\sqrt{3}\right)$

$15\sqrt{12}+6\sqrt{6}$

$\sqrt{4}\sqrt{3}$

$2\sqrt{3}$

$30\sqrt{3}+6\sqrt{6}$

9. $(3+\sqrt{5})(3-\sqrt{5})$

$9-3\sqrt{5}+3\sqrt{5}-5$

4

10. $(\sqrt{6}+3)(\sqrt{2}-4)$

$\sqrt{12}-4\sqrt{6}+3\sqrt{2}-12$

$\sqrt{4}\sqrt{3}$

$2\sqrt{3}-4\sqrt{6}+3\sqrt{2}-12$

11. $\frac{5}{\sqrt{6}}\cdot\frac{\sqrt{6}}{\sqrt{6}}=\frac{5\sqrt{6}}{6}$

12. $\frac{7}{3\sqrt{5}}\cdot\frac{\sqrt{5}}{\sqrt{5}}$

$\frac{7\sqrt{5}}{3\cdot 5}=\frac{7\sqrt{5}}{15}$

13. $\frac{\sqrt{60}}{\sqrt{10}}$

$i^1=i$ $i^2=-1$ ~~$i^3=i$~~ ~~$i^4=1$~~

Simplify. No decimals!

1. $\sqrt{-49}$

2. $-5\sqrt{-144}$

$-5i\sqrt{144}$

$\cdot 12.$

$-60i$

3. $\sqrt{-75}$

4. $10\sqrt{-50}$

5. $(-6+4i)+(3-9i)$

6. $(7-6i)-(-2+5i)$

7. $(2+12i)+(9-3i)$

8. $(-6+3i)-(4-2i)$

9. $(3-5i)(1+i)$

$3+3i-5i-5i^2$

6^{-1}

$9-2i$

10. $(3+5i)^2$

11. $\sqrt{-6}\cdot\sqrt{-2}$

$i\sqrt{6}\cdot i\sqrt{2}$

$i^2\sqrt{12}$

$-\sqrt{4}\sqrt{3}$

$-2\sqrt{3}$

12. $3\sqrt{-5}\cdot 2\sqrt{-10}$

$3i\sqrt{5}\cdot 2i\sqrt{10}$

$6i^2\sqrt{50}$

$-6\sqrt{25}\sqrt{2}$

$-30\sqrt{2}$

13. i^{17}

$i^{16}\cdot i$

$(i^2)^8\cdot i$

$(-1)^8\cdot i = i$

14. i^{20}

$(i^2)^{10}$

$-1^{10} = 1$

15. $(3-i)(3+i)(1+i)$

$9+3i-3i-i^2$

$-i$

$9+1$

$-(-1)$

$10(1+i)$

$10+10i$

16. $3c^2d^2e\sqrt{-20c^2d^6e^5}$

$3c^2d^2e\,i\cdot 2cde^2\sqrt{5e}$

$6c^3d^5e^3i\sqrt{5e}$

$\sqrt{20}$

$\sqrt{4}\sqrt{5}$

$2\sqrt{5}$

17. i^7 $i^6 \cdot i$ $(i^2)^3 \cdot i$ $-1^3 \cdot i$ $-i$

18. i^{102} $(i^2)^{51}$ $-1^{51} = -1$

19. $\sqrt{-225x^{10}y^6}$

20. $-3x\sqrt{-121x^8}$

21. $(1-4i)^2$ $(1-4i)(1-4i)$ $1-4i-4i+16i^2$ -16^{-1} $-15-8i$

22. $(5-i)(5+i)$

Solve:

23. $-3x^2-1=2$ $\frac{-3x^2}{-3} = \frac{3}{-3}$ $\sqrt{x^2} = \pm\sqrt{-1}$ $x = \pm i$

24. $2x^2+20=0$