Name ______________________

LESSON 1.5

Practice A

Simplify the expression.

1. $\sqrt{18}$ $3\sqrt{2}$
2. $\sqrt{48}$ $4\sqrt{3}$
3. $\sqrt{20}$ $2\sqrt{5}$
4. $\sqrt{98}$ $7\sqrt{2}$
5. $\sqrt{9}\cdot 3\sqrt{27}$ $27\sqrt{3}$
6. $\sqrt{12}\cdot\sqrt{7}$ $2\sqrt{21}$
7. $\sqrt{\frac{25}{16}}$ $\frac{5}{4}$
8. $\sqrt{\frac{49}{9}}$ $\frac{7}{3}$
9. $\sqrt{\frac{100}{25}}$ $\frac{10}{5}=2$
10. $\sqrt{\frac{27}{1}}$ $3\sqrt{3}$
11. $\sqrt{\frac{45}{3}}$ $=\sqrt{15}$
12. $\sqrt{\frac{4}{5}}\cdot\sqrt{\frac{3}{5}}$ $=\frac{2\sqrt{3}}{5}$
13. $\frac{1}{(3+\sqrt{3})}\cdot\frac{(3-\sqrt{3})}{(3-\sqrt{3})}=\frac{3-\sqrt{3}}{6}$ $9-3$
14. $\frac{2}{5-\sqrt{6}}\cdot\frac{(5+\sqrt{6})}{5+\sqrt{6}}=\frac{10+2\sqrt{6}}{19}$ $25-6$
15. $\frac{(1+\sqrt{5})}{(5+\sqrt{5})}\cdot\frac{(5-\sqrt{5})}{(5-\sqrt{5})}=\frac{5+4\sqrt{5}-5}{25-5}$ $\frac{4\sqrt{5}}{20}=$ $\frac{\sqrt{5}}{5}$

1. $\sqrt{242}$ $2\ 121$ $=11\sqrt{2}$
2. $\sqrt{153}$ $3\ 51$ $=3\sqrt{17}$
3. $\sqrt{56}$ $4\ 14$ $=2\sqrt{14}$
4. $5\sqrt{24}\cdot 2\sqrt{28}$ $=40\sqrt{42}$ $6\ 4$ $4\ 7$

5. $\sqrt{8}\cdot 3\sqrt{40}\cdot\sqrt{3}$ $2\sqrt{2}\cdot 6\sqrt{10}\cdot\sqrt{3}$ $64\sqrt{15}$ $24\sqrt{15}$
6. $\sqrt{10}\cdot\sqrt{14}$ $2\sqrt{35}$
7. $\sqrt{\frac{121}{225}}$ $\frac{11}{15}$
8. $\sqrt{\frac{7}{9}}\cdot\sqrt{\frac{4}{7}}$ $\frac{2}{3}$
9. $\cancel{\sqrt{24}}\cdot\sqrt{\frac{80}{192}}$ $\frac{40}{96}$ $\frac{10}{\cancel{24}}$ $=\sqrt{10}$
10. $\frac{3}{(4+\sqrt{5})}\cdot\frac{(4-\sqrt{5})}{(4-\sqrt{5})}=\frac{12-3\sqrt{5}}{11}$ $16-5$
11. $\frac{-6}{(5-\sqrt{11})}\cdot\frac{(5+\sqrt{11})}{(5+\sqrt{11})}=\frac{-30-6\sqrt{11}}{14}=\frac{-15-3\sqrt{11}}{7}$ $25-11$
12. $\frac{(7-\sqrt{7})}{(10+\sqrt{3})}\cdot\frac{(10-\sqrt{3})}{(10-\sqrt{3})}=\frac{70-7\sqrt{3}-10\sqrt{7}-\sqrt{21}}{97}$ $100-3$

Write the expression as a complex number in standard form.

10. $(1+i)+(3+i)$ $4+2i$
11. $(4-3i)+(2+6i)$ $6+3i$
12. $(-4-i)-(4+5i)$ $-8-6i$
13. $(5-3i)+(-3-6i)$ $2-9i$
14. $3i(4+2i)$ $6i^2$ $-6+12i$
15. $-2i(3-i)$ $-2-6i$
16. $(2+i)(4+2i)$ $6+8i$
17. $(5-2i)(1-3i)$ -2 $+6i^2$ $-1-17i$
18. $-(3+i)(7-3i)$ $-3i^2$ $-24+2i$
19. $-2i(1+i)(2+3i)$ $3i^2$ $10+2i$
20. $(2-i)^2$ $+i^2$ $3-4i$
21. $(5+3i)(5-3i)$ $25-9i^2$ 34

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22. $\frac{5}{(3-2i)}\cdot\frac{(3+2i)}{(3+2i)}=\frac{15+10i}{13}$ $9+4i^2$
23. $\frac{(2-i)}{(3+4i)}\cdot\frac{(3-4i)}{(3-4i)}=\frac{2-11i}{25}$ $9-16i^2$
24. $\frac{(1+2i)}{(\sqrt{2}+i)}\cdot\frac{(\sqrt{2}-i)}{(\sqrt{2}-i)}=\frac{\sqrt{2}-i+2i\sqrt{2}+2}{3}$ $2-i^2$

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25. $\frac{(3)(2+4i)}{(2-4i)(2+4i)}-(3+2i)$

$\frac{6+12i}{4-16i^2}=\frac{6+12i}{20}=\frac{3+6i}{10}-\frac{(30+20i)}{10}=\frac{-27-14i}{10}=\frac{-27}{10}-\frac{14}{10}i$

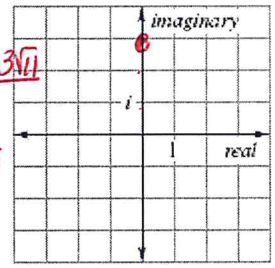
$=\boxed{-\frac{27}{10}-\frac{7}{5}i}$

Find the absolute value of the complex number.

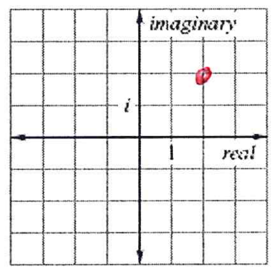
26. $3-4i$ $=\sqrt{9+16}=5$
27. $1-i\sqrt{3}$ $\sqrt{(1)^2+(-\sqrt{3})^2}=\sqrt{1+3}=2$
28. $\sqrt{5}+2i\sqrt{2}$ $\sqrt{(\sqrt{5})^2+(2\sqrt{2})^2}$ $\sqrt{5+4\cdot 2}$ $\sqrt{13}$

Plot the numbers in a complex plane.

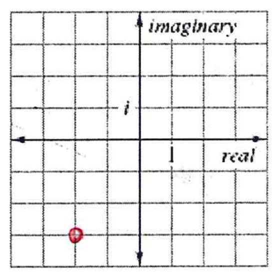
29. $3i$



30. $2+2i$



31. $-2-3i$



Using the properties of exponents, write the complex number in standard form.

32. $2+i^2$ $2-1=1$
33. $3+i^3$ $3+(-1)i=3-i$
34. $5-i^4$ $5-1=4$
35. $2-i^5$ $2-i$

22. $\dfrac{5}{(3-2i)} \cdot \dfrac{(3+2i)}{(3+2i)} = \dfrac{15+10i}{13} = \boxed{\dfrac{15}{13} + \dfrac{10}{13}i}$

$9-4i^2$

$9+4$

23. $\dfrac{(2-i)}{(3+4i)} \cdot \dfrac{(3-4i)}{(3-4i)} = \dfrac{6-8i-3i+\overset{-4}{4i^2}}{25} = \dfrac{2-11i}{25} = \boxed{\dfrac{2}{25} - \dfrac{11}{25}i}$

$9-16i^2$

$9+16$

24. $\dfrac{(1+2i)}{(\sqrt{2}+i)} \cdot \dfrac{(\sqrt{2}-i)}{(\sqrt{2}-i)} = \dfrac{\sqrt{2}-i+2i\sqrt{2}\overset{+2}{-2i^2}}{2-i^2} = \dfrac{2+\sqrt{2}-i+2i\sqrt{2}}{2+1}$

$= \dfrac{2+\sqrt{2}+(2\sqrt{2}-1)i}{3} = \boxed{\dfrac{2+\sqrt{2}}{3} + \dfrac{2\sqrt{2}-1}{3}i}$