

NAME \_\_\_\_\_ DATE \_\_\_\_\_ SCORE \_\_\_\_\_

## The Imaginary Number $i$ ; The Complex Numbers

Simplify.

- |   |   |                                       |
|---|---|---------------------------------------|
| 1. $\sqrt{-18}$ _____   | 2. $-\sqrt{-75}$ _____  | 3. $i\sqrt{-48}$ _____                |
| 4. $\sqrt{-\frac{3}{4}}$ _____  | 5. $\sqrt{-\frac{2}{5}}$ _____                                      | 6. $\frac{\sqrt{-6}}{\sqrt{2}}$ _____ |
| 7. $\sqrt{-2} \cdot \sqrt{-32}$ _____                                   | 8. $\sqrt{35} \cdot \sqrt{-7}$ _____                                |                                       |
| 9. $\sqrt{-3} \cdot \sqrt{-12} \cdot \sqrt{-4}$ _____                   | 10. $\sqrt{-4} \cdot \sqrt{2} \cdot \sqrt{-8} \cdot \sqrt{4}$ _____ |                                       |
| 11. $\frac{\sqrt{3}}{\sqrt{-6}} \cdot \frac{\sqrt{-2}}{\sqrt{9}}$ _____ | 12. $\frac{\sqrt{-5}}{\sqrt{-24}} \cdot \sqrt{-\frac{10}{3}}$ _____ |                                       |
| 13. $\sqrt{-18} + \sqrt{-50}$ _____                                     | 14. $\sqrt{-48} - 2\sqrt{-12}$ _____                                |                                       |
| 15. $\sqrt{-180} - 2i\sqrt{-245}$ _____                                 |   |                                       |
| 16. $\sqrt{-8} - 2\sqrt{-50} + \sqrt{27} - i\sqrt{108}$ _____           |   |                                       |

Solve.

- |                         |                           |
|-------------------------|---------------------------|
| 17. $3w^2 = -147$ _____ | 18. $6z^2 + 57 = 9$ _____ |
|-------------------------|---------------------------|

Simplify each expression.

- |                                   |  |
|-----------------------------------|--|
| 19. $(5 - 2i) + (1 + 5i)$ _____   | 20. $(4 + 3i) - (2 - i)$ _____   |
| 21. $2(3 - 5i) - 3(1 - 2i)$ _____ | 22. $4i - (6 - 3i)$ _____  |
| 23. $i(2 + 3i) - 2(1 - i)$ _____  | 24. $3i(1 - 2i) - 2i(2 - 3i)$ _____  |
| 25. $(1 + 2i)(2 - i)$ _____       | 26. $(5 - 3i)(4 + i)$ _____  |
| 27. $(2 + i)^2$ _____             | 28. $(3 + 5i)(3 - 5i)$ _____   |
| 29. $\frac{1 - 2i}{2 + i}$ _____  | 30. $\frac{3 - i}{3 + 2i}$ _____   |
| 31. $\frac{3 + 4i}{1 - i}$ _____  | 32. $\left(\frac{2 - 3i}{1 + i}\right) \cdot \left(\frac{3 + 2i}{3i}\right)$ _____ |

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### The Imaginary Number $i$ ; The Complex Numbers

Simplify.

1.  $\sqrt{-18} = \frac{3i\sqrt{2}}{1}$
2.  $-\sqrt{-75} = \frac{-5i\sqrt{3}}{1}$
3.  $i\sqrt{-48} = \frac{-4\sqrt{3}}{1}$
4.  $\sqrt{-\frac{3}{4}} = \frac{i\sqrt{3}}{2}$
5.  $\sqrt{-\frac{2}{5}} = \frac{i\sqrt{10}}{5}$
6.  $\frac{\sqrt{-6}}{\sqrt{2}} = \frac{i\sqrt{3}}{1}$
7.  $\sqrt{-2} \cdot \sqrt{-32} = -8$
8.  $\sqrt{35} \cdot \sqrt{-7} = 7i\sqrt{5}$
9.  $\sqrt{-3} \cdot \sqrt{-12} \cdot \sqrt{-4} = -12i$
10.  $\sqrt{-4} \cdot \sqrt{2} \cdot \sqrt{-8} \cdot \sqrt{4} = -16$
11.  $\frac{\sqrt{3}}{\sqrt{-6}} \cdot \frac{\sqrt{-2}}{\sqrt{9}} = \frac{1}{3}$
12.  $\frac{\sqrt{-5}}{\sqrt{-24}} \cdot \sqrt{-\frac{10}{3}} = \frac{5i}{6}$
13.  $\sqrt{-18} + \sqrt{-50} = 8i\sqrt{2}$
14.  $\sqrt{-48} - 2\sqrt{-12} = 0$
15.  $\sqrt{-180} - 2i\sqrt{-245} = (14+6i)\sqrt{5}$
16.  $\sqrt{-8} - 2\sqrt{-50} + \sqrt{27} - i\sqrt{108} = (3-6i)\sqrt{3} - 8i\sqrt{2}$

Solve.

17.  $3w^2 = -147 \Rightarrow \{\pm 7i\}$
18.  $6z^2 + 57 = 9 \Rightarrow \{\pm 2i\sqrt{2}\}$

Simplify each expression.

19.  $(5 - 2i) + (1 + 5i) = 6 + 3i$
20.  $(4 + 3i) - (2 - i) = 2 + 4i$
21.  $2(3 - 5i) - 3(1 - 2i) = 3 - 4i$
22.  $4i - (6 - 3i) = -6 + 7i$
23.  $i(2 + 3i) - 2(1 - i) = -5 + 4i$
24.  $3i(1 - 2i) - 2i(2 - 3i) = -i$
25.  $(1 + 2i)(2 - i) = 4 + 3i$
26.  $(5 - 3i)(4 + i) = 23 - 7i$
27.  $(2 + i)^2 = 3 + 4i$
28.  $(3 + 5i)(3 - 5i) = 34$
29.  $\frac{1 - 2i}{2 + i} = -i$
30.  $\frac{3 - i}{3 + 2i} = \frac{7 - 9i}{13}$
31.  $\frac{3 + 4i}{1 - i} = \frac{1}{2} + \frac{7}{2}i$
32.  $(\frac{2 - 3i}{1 + i}) \cdot (\frac{3 + 2i}{3i}) = \frac{17}{6} - \frac{7}{6}i$

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Simplify each letter in the of the prob

The junior plan for the Konja Gate Discarding agreed to tr

1.  $\sqrt[3]{-64}$
2.  $-\sqrt{81}$
3.  $\sqrt[3]{-\frac{5}{16}}$
4.  $\sqrt{25}^2$
5.  $\sqrt[4]{81^2}$
6.  $\sqrt[4]{\frac{5}{9}}$
7.  $5\sqrt{3} -$
8.  $(3 + \sqrt{5} - \sqrt{3} + \sqrt{5})$
9.  $\frac{\sqrt{5} - \sqrt{3}}{\sqrt{5} + \sqrt{3}}$
10.  $0.18$
11.  $\sqrt{-81}$
12.  $i\sqrt{-15}$
13.  $\frac{2 - i}{1 + 2i}$