NAME_

DATE_____ SCORE____

The Imaginary Number i; The Complex Numbers

Simplify.

1.
$$\sqrt{-18}$$

1.
$$\sqrt{-18}$$

3.
$$i\sqrt{-48}$$

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

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

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.
$$(5-2i)+(1+5i)$$

21.
$$2(3-5i)-3(1-2i)$$

23.
$$i(2 + 3i) - 2(1 - i)$$

25.
$$(1 + 2i)(2 - i)$$

27.
$$(2 + i)^2$$

29.
$$\frac{1-2i}{2+i}$$

31.
$$\frac{3+4i}{1-i}$$

20.
$$(4 + 3i) - (2 - i)$$

22.
$$4i - (6 - 3i)$$

24.
$$3i(1-2i)-2i(2-3i)$$

26.
$$(5-3i)(4+i)$$

28.
$$(3 + 5i)(3 - 5i)$$

30.
$$\frac{3-i}{3+2i}$$

32.
$$(\frac{2-3i}{1+i}) \cdot (\frac{3+2i}{3i})$$







For use after Section 6-8 of text ALGEBRA AND TRIGONOMETRY, Structure and Method, Book 2 Sheet 37

NAME	DATE	SCORE
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The Imaginary Number i; The Complex Numbers

Simplify.

1.
$$\sqrt{-18}$$
 $3i\sqrt{3}$ 2. $-\sqrt{-75}$ $\frac{-5i\sqrt{3}}{i\sqrt{10}}$ 3. $i\sqrt{-48}$ $\frac{-4\sqrt{3}}{-4\sqrt{3}}$ 4. $\sqrt{-\frac{3}{4}}$ 2 5. $\sqrt{-\frac{2}{5}}$ 5 6. $\sqrt{\frac{-6}{\sqrt{2}}}$

2.
$$-\sqrt{-75} \frac{-5i\sqrt{3}}{2\sqrt{10}}$$
5. $\sqrt{-\frac{2}{5}} \frac{5}{5}$

3.
$$i\sqrt{-48} - 4\sqrt{3}$$

6. $\frac{\sqrt{-6}}{\sqrt{3}} - i\sqrt{3}$

7.
$$\sqrt{-2} \cdot \sqrt{-32} - 8$$

8.
$$\sqrt{35} \cdot \sqrt{-7}$$
 7 $i\sqrt{5}$

9.
$$\sqrt{-3} \cdot \sqrt{-12} \cdot \sqrt{-4} \quad \underline{-12i}$$

9.
$$\sqrt{-3} \cdot \sqrt{-12} \cdot \sqrt{-4} \quad -12i$$
10. $\sqrt{-4} \cdot \sqrt{2} \cdot \sqrt{-8} \cdot \sqrt{4} \quad -16$
11. $\frac{\sqrt{3}}{\sqrt{-6}} \cdot \frac{\sqrt{-2}}{\sqrt{9}} \quad \frac{\frac{1}{3}}{\sqrt{-24}}$
12. $\frac{\sqrt{-5}}{\sqrt{-24}} \cdot \sqrt{-\frac{10}{3}} \quad \frac{5i}{6}$
13. $\sqrt{-18} + \sqrt{-50} \cdot 8i\sqrt{2}$
14. $\sqrt{-48} - 2\sqrt{-12} = 0$

11.
$$\frac{\sqrt{3}}{\sqrt{5}} \cdot \frac{\sqrt{-2}}{\sqrt{5}} = \frac{\frac{1}{3}}{3}$$

14.
$$\sqrt{-48} - 2\sqrt{-12} = 0$$

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.
$$\sqrt{-8} - 2\sqrt{-50} + \sqrt{27} - i\sqrt{108} (3-6i)\sqrt{3} - 8i\sqrt{2}$$

17.
$$3w^2 = -147 \frac{\{\pm 7i\}}{}$$

18.
$$6z^2 + 57 = 9 \left\{ \pm 2i\sqrt{2} \right\}$$

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.
$$4i - (6 - 3i) = \frac{-6 + 7i}{2}$$

23.
$$i(2 + 3i) - 2(1 - i) - 5 + 4i$$

25. $(1 + 2i)(2 - i) - 4 + 3i$

24.
$$3i(1-2i) - 2i(2-3i)$$

27.
$$(2 + i)^2 = 3 + 4i$$

26.
$$(5-3i)(4+i)$$
 $23-7i$

27.
$$(2 + i)^2 = 3 + 4i$$

28.
$$(3 + 5i)(3 - 5i)$$
 34

28.
$$(3 + 5i)(3 - 5i)$$
 $3^{\frac{14}{3}}$
30. $\frac{3 - i}{3 + 2i}$ $\frac{7}{13} - \frac{9}{13}\dot{i}$

31.
$$\frac{3+4i}{1-i} - \frac{1}{2} + \frac{7}{2}i$$

32.
$$(\frac{2-3i}{1+i}) \cdot (\frac{3+2i}{3i}) = \frac{-\frac{17}{6} - \frac{7}{6}i}{}$$

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For use after

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

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