

Set A

Simplify the radical.

- | | | |
|-----------------|-----------------|------------------|
| 1. $\sqrt{-9}$ | 2. $\sqrt{-4}$ | 3. $-\sqrt{-25}$ |
| 4. $-\sqrt{-1}$ | 5. $\sqrt{-16}$ | 6. $-\sqrt{-49}$ |

Set B

Simplify the radical.

- | | | |
|------------------|------------------|-------------------|
| 7. $\sqrt{-20}$ | 8. $\sqrt{-75}$ | 9. $\sqrt{-50}$ |
| 10. $\sqrt{-18}$ | 11. $\sqrt{-96}$ | 12. $\sqrt{-150}$ |

Set C

Simplify the radical.

- | | | |
|----------------------------|-------------------------|-------------------------|
| 13. $\sqrt{-27a^2}$ | 14. $\sqrt{-16c^2d^2}$ | 15. $\sqrt{-50x^2yz^3}$ |
| 16. $\sqrt{-320y^9z^{10}}$ | 17. $\sqrt{-64x^4}$ | 18. $\sqrt{-100a^4b^2}$ |
| 19. $\sqrt{-56a^3b^5}$ | 20. $\sqrt{-125x^3y^6}$ | 21. $\sqrt{-150x^7y^8}$ |

1. _____
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7. _____
8. _____
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10. _____
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13. _____
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19. _____
20. _____
21. _____



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Set D

Simplify the expression.

- | | | |
|--------------------------------|--------------|--------------|
| 22. i (What does i equal?) | 23. i^2 | 24. i^3 |
| 25. i^4 | 26. i^5 | 27. i^6 |
| 28. i^7 | 29. i^8 | 30. i^{10} |
| 31. i^{12} | 32. i^{20} | 33. i^{30} |

Set E

Perform the indicated operation.

- | | |
|---------------------------|------------------------------|
| 34. $(3 + 2i) + (9 + i)$ | 35. $(9 + 2i) + (3 - i)$ |
| 36. $(-4 + i) + (i - 4)$ | 37. $(1 + i) + (7 - 4i)$ |
| 38. $(5 - 3i) - (-1 + i)$ | 39. $(2 - i) - (5 + i)$ |
| 40. $(1 - 3i) - (9 + i)$ | 41. $(-4 + 6i) - (-3 + 12i)$ |

Set F

Perform the indicated operation.

- | | | |
|--------------------------|------------------------|-------------------------|
| 42. $i(1 + i)$ | 43. $i(2 - i)$ | 44. $-i(5 + 2i)$ |
| 45. $3i(1 - 2i)$ | 46. $2i(6 + i)$ | 47. $-8i(6 + i)$ |
| 48. $(3 + i)(2 + i)$ | 49. $(2 + 7i)(4 + 2i)$ | 50. $(1 + 4i)(2 + i)$ |
| 51. $(9 - 10i)(-8 + 3i)$ | 52. $(-7 - i)(3 + 2i)$ | 53. $(-14 + 6i)(1 - i)$ |

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- 34. _____
- 35. _____
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- 42. _____
- 43. _____
- 44. _____
- 45. _____
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- 47. _____
- 48. _____
- 49. _____
- 50. _____
- 51. _____
- 52. _____
- 53. _____



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* $\sqrt{-1} = i$

Set A

Simplify the radical.

1. $\sqrt{-9} = \sqrt{9} \sqrt{-1} = 3i$
 2. $\sqrt{-4} = \sqrt{4} \sqrt{-1} = 2i$
 3. $-\sqrt{-25} = -\sqrt{25} \sqrt{-1} = -5i$
 4. $-\sqrt{-1} = -1$
 5. $\sqrt{-16} = \sqrt{16} \sqrt{-1} = 4i$
 6. $-\sqrt{-49} = -\sqrt{49} \sqrt{-1} = -7i$

1. 3i
 2. 2i
 3. -5i
 4. -1
 5. 4i
 6. -7i

Set B

Simplify the radical.

7. $\sqrt{-20} = \sqrt{-1} \sqrt{4} \sqrt{5} = i \cdot 2\sqrt{5}$
 8. $\sqrt{-75} = \sqrt{-1} \sqrt{25} \sqrt{3} = i \cdot 5\sqrt{3}$
 9. $\sqrt{-50} = \sqrt{-1} \sqrt{25} \sqrt{2} = i \cdot 5\sqrt{2}$
 10. $\sqrt{-18} = \sqrt{-1} \sqrt{9} \sqrt{2} = i \cdot 3\sqrt{2}$
 11. $\sqrt{-96} = \sqrt{-1} \sqrt{16} \sqrt{6} = i \cdot 4\sqrt{6}$
 12. $\sqrt{-150} = \sqrt{-1} \sqrt{25} \sqrt{6} = i \cdot 5\sqrt{6}$

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7. 2i√5
 8. 5i√3
 9. 5i√2
 10. 3i√2
 11. 4i√6
 12. 5i√6

Set C

Simplify the radical.

13. $\sqrt{-27a^2} = \sqrt{-1} \sqrt{9} \sqrt{3} a = i \cdot 3a\sqrt{3}$
 14. $\sqrt{-16c^2d^2} = \sqrt{-1} \sqrt{16} \sqrt{c^2} \sqrt{d^2} = i \cdot 4cd$
 15. $\sqrt{-50x^2yz^3} = \sqrt{-1} \sqrt{25} \sqrt{2} \sqrt{x^2} \sqrt{y} \sqrt{z^2} \sqrt{z} = i \cdot 5xz\sqrt{2yz}$
 16. $\sqrt{-320y^9z^{10}} = \sqrt{-1} \sqrt{64} \sqrt{5} \sqrt{8} \sqrt{y^8} \sqrt{z^{10}} = i \cdot 8y^4z^5\sqrt{5y}$
 17. $\sqrt{-64x^4} = \sqrt{-1} \sqrt{64} \sqrt{x^4} = 8x^2i$
 18. $\sqrt{-100a^4b^2} = \sqrt{-1} \sqrt{100} \sqrt{a^4} \sqrt{b^2} = i \cdot 10a^2b$
 19. $\sqrt{-56a^3b^5} = \sqrt{-1} \sqrt{4} \sqrt{14} \sqrt{a^2} \sqrt{a} \sqrt{b^4} \sqrt{b} = i \cdot 2ab^2\sqrt{14ab}$
 20. $\sqrt{-125x^3y^6} = \sqrt{-1} \sqrt{25} \sqrt{5} \sqrt{x^2} \sqrt{y^6} = i \cdot 5xy^3\sqrt{5}$
 21. $\sqrt{-150x^7y^8} = \sqrt{-1} \sqrt{25} \sqrt{6} \sqrt{x^6} \sqrt{xy^8} = i \cdot 5x^3y^4\sqrt{6x}$



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13. 3ai√3
 14. 4cdi
 15. 5xzi√2yz
 16. 8y^4z^5i√5y
 17. 8x^2i
 18. 10a^2bi
 19. 2ab^2i√14ab
 20. 5xy^3i√5
 21. 5x^3y^4i√6x



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Set D

Simplify the expression.

22. i (What does i equal?)
 23. $i^2 = (\sqrt{-1})^2 = -1$
 24. $i^3 = i^2 \cdot i = -1 \cdot \sqrt{-1} = -i$
 25. $i^4 = (i^2)^2 = (-1)^2 = 1$
 26. $i^5 = i^4 \cdot i = 1 \cdot \sqrt{-1} = i$
 27. $i^6 = i^4 \cdot i^2 = 1 \cdot -1 = -1$
 28. $i^7 = i^4 \cdot i^3 = 1 \cdot -i = -i$
 29. $i^8 = i^4 \cdot i^4 = 1 \cdot 1 = 1$
 30. $i^{10} = i^4 \cdot i^4 \cdot i^2 = 1 \cdot 1 \cdot -1 = -1$
 31. $i^{12} = (i^4)^3 = (1)^3 = 1$
 32. $i^{20} = (i^4)^5 = (1)^5 = 1$
 33. $i^{30} = (i^4)^7 \cdot i^2 = (1)^7 \cdot (-1) = -1$

22. $\sqrt{-1}$
 23. -1
 24. $-\sqrt{-1}$
 25. 1
 26. $-\sqrt{-1}$
 27. -1
 28. $-\sqrt{-1}$
 29. 1
 30. -1
 31. 1
 32. 1
 33. -1

Set E

Perform the indicated operation.

34. $(3+2i) + (9+i) = 12+3i$
 35. $(9+2i) + (3-i) = 12+i$
 36. $(-4+i) + (i-4) = -8+2i$
 37. $(1+i) + (7-4i) = 8-3i$
 38. $(5-3i) + (-1+i) = 4-2i$
 39. $(2-i) + (5+i) = 7$
 40. $(1-3i) + (9+i) = 10-2i$
 41. $(-4+6i) + (-3+12i) = -7+18i$

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34. $12+3i$
 35. $12+i$
 36. $-8+2i$
 37. $8-3i$
 38. $6-4i$
 39. $-3-2i$
 40. $-8-4i$
 41. $-1-6i$

Set F

Perform the indicated operation.

42. $i(1+i) = i + i^2 = i - 1 = -1+i$
 43. $i(2-i) = 2i - i^2 = 2i - (-1) = 2i + 1 = 1+2i$
 44. $-i(5+2i) = -5i - 2i^2 = -5i - 2(-1) = -5i + 2 = 2-5i$
 45. $3i(1-2i) = 3i - 6i^2 = 3i - 6(-1) = 3i + 6 = 6+3i$
 46. $2i(6+i) = 12i + 2i^2 = 12i + 2(-1) = 12i - 2 = -2+12i$
 47. $-8i(6+i) = -48i - 8i^2 = -48i - 8(-1) = -48i + 8 = 8-48i$
 48. $(3+i)(2+i) = 6 + 3i + 2i + i^2 = 6 + 5i + (-1) = 5+5i$
 49. $(2+7i)(4+2i) = 8 + 4i + 28i + 14i^2 = 8 + 32i + 14(-1) = -6+32i$
 50. $(1+4i)(2+i) = 2 + i + 8i + 4i^2 = 2 + 9i + 4(-1) = -2+9i$
 51. $(9-10i)(-8+3i) = -72 + 27i + 80i - 30i^2 = -72 + 107i + 30 = -42+107i$
 52. $(-7-i)(3+2i) = -21 - 14i - 3i - 2i^2 = -21 - 17i + 2 = -19-17i$
 53. $(-14+6i)(1-i) = -14 + 14i + 6i - 6i^2 = -14 + 20i + 6 = -8+20i$

42. $-1+i$
 43. $1+2i$
 44. $2-5i$
 45. $6+3i$
 46. $-2+12i$
 47. $8-48i$
 48. $5+5i$
 49. $-6+32i$
 50. $-2+9i$
 51. $-42+107i$
 52. $-19-17i$
 53. $-8+20i$

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