

**General Algebra II**  
**Lesson #5 Unit 7**  
**Class Worksheet #5**  
**For Worksheet #7**

**General Algebra II Class Worksheet #5 Unit 7**

**Perform the indicated operations. Express complex answers in a + bi form.**

1.  $\frac{8i}{4i} =$

2.  $\frac{8}{4i} =$

## General Algebra II Class Worksheet #5 Unit 7

Perform the indicated operations. Express complex answers in  $a + bi$  form.

1.  $\frac{8i}{4i} =$

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Division problems are written using fraction notation.

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Division problems are written using fraction notation.  $\frac{n}{d} =$

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This problem involves dividing an imaginary number by an imaginary number.

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**This problem involves dividing an imaginary number by an imaginary number. In problems like this, you should treat the imaginary number  $i$  like a variable.**



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This problem involves dividing an imaginary number by an imaginary number. In problems like this, you should treat the imaginary number  $i$  like a variable. Since  $i$  is a factor of both terms, you can 'reduce' the fraction.

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$$1. \quad \frac{8i}{4i} = \frac{8}{4} = 2$$

$$2. \quad \frac{8}{4i} =$$

Division problems are written using fraction notation.  $\frac{n}{d} = n \div d$ .

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Division problems are written using fraction notation.  $\frac{n}{d} = n \div d$ .

This problem involves dividing an imaginary number by an imaginary number. In problems like this, you should treat the imaginary number  $i$  like a variable. Since  $i$  is a factor of both terms, you can ‘reduce’ the fraction. An imaginary number divided by an imaginary number is a real number.

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1.  $\frac{8i}{4i} = \frac{8}{4} = 2$

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**This problem involves dividing a real number by an imaginary number. In problems like this, you must make the divisor, the denominator, a real number.**



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Division problems are written using fraction notation.  $\frac{n}{d} = n \div d$ .

**This problem involves dividing a real number by an imaginary number. In problems like this, you must make the divisor, the denominator, a real number. Multiply both terms of the fraction by  $i$ .**

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Perform the indicated operations. Express complex answers in a + bi form.

1.  $\frac{8i}{4i} = \frac{8}{4} = 2$

2.  $\frac{8}{4i} = \frac{8i}{4i^2}$

Division problems are written using fraction notation.  $\frac{n}{d} = n \div d$ .

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Division problems are written using fraction notation.  $\frac{n}{d} = n \div d$ .

**This problem involves dividing a real number by an imaginary number. In problems like this, you must make the divisor, the denominator, a real number. Multiply both terms of the fraction by i. Since  $i^2 = -1$ , the divisor is now a real number.**

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$$1. \quad \frac{8i}{4i} = \frac{8}{4} = 2$$

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Division problems are written using fraction notation.  $\frac{n}{d} = n \div d$ .

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$$1. \quad \frac{8i}{4i} = \frac{8}{4} = 2$$

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**This problem involves dividing a real number by an imaginary number. In problems like this, you must make the divisor, the denominator, a real number. Multiply both terms of the fraction by i. Since  $i^2 = -1$ , the divisor is now a real number. The division proceeds as if i was a variable. A real number divided by an imaginary number is an imaginary number.**

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3.  $\frac{6 + 9i}{3} =$

4.  $\frac{4 - 9i}{6} =$

Division problems are written using fraction notation.  $\frac{n}{d} = n \div d$ .

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$$3. \quad \frac{6 + 9i}{3} =$$

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These problems involve dividing a complex number by a real number.

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$$3. \quad \frac{6 + 9i}{3} =$$

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Division problems are written using fraction notation.  $\frac{n}{d} = n \div d$ .

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In problems like these, the number  $i$  is treated as a variable.

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Division problems are written using fraction notation.  $\frac{n}{d} = n \div d$ .

**These problems involve dividing a complex number by a real number. In problems like these, the number  $i$  is treated as a variable. Simply divide both terms of the complex number by the real number.**

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$$3. \quad \frac{6 + 9i}{3} =$$

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$$3. \quad \frac{6 + 9i}{3} = \frac{6}{3}$$

$$4. \quad \frac{4 - 9i}{6} =$$

Division problems are written using fraction notation.  $\frac{n}{d} = n \div d$ .

**These problems involve dividing a complex number by a real number. In problems like these, the number  $i$  is treated as a variable. Simply divide both terms of the complex number by the real number.**

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Perform the indicated operations. Express complex answers in  $a + bi$  form.

$$3. \quad \frac{6+9i}{3} = \frac{6}{3} +$$

$$4. \quad \frac{4-9i}{6} =$$

Division problems are written using fraction notation.  $\frac{n}{d} = n \div d$ .

**These problems involve dividing a complex number by a real number. In problems like these, the number  $i$  is treated as a variable. Simply divide both terms of the complex number by the real number.**



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$$3. \quad \frac{6+9i}{3} = \frac{6}{3} + \frac{9i}{3}$$

$$4. \quad \frac{4-9i}{6} =$$

Division problems are written using fraction notation.  $\frac{n}{d} = n \div d$ .

**These problems involve dividing a complex number by a real number. In problems like these, the number  $i$  is treated as a variable. Simply divide both terms of the complex number by the real number.**

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Perform the indicated operations. Express complex answers in  $a + bi$  form.

$$3. \quad \frac{6+9i}{3} = \frac{6}{3} + \frac{9i}{3} =$$

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Division problems are written using fraction notation.  $\frac{n}{d} = n \div d$ .

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$$3. \quad \frac{6+9i}{3} = \frac{6}{3} + \frac{9i}{3} = 2$$

$$4. \quad \frac{4-9i}{6} =$$

Division problems are written using fraction notation.  $\frac{n}{d} = n \div d$ .

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$$3. \quad \frac{6+9i}{3} = \frac{6}{3} + \frac{9i}{3} = 2 +$$

$$4. \quad \frac{4-9i}{6} =$$

Division problems are written using fraction notation.  $\frac{n}{d} = n \div d$ .

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$$3. \quad \frac{6+9i}{3} = \frac{6}{3} + \frac{9i}{3} = 2 + 3i$$

$$4. \quad \frac{4-9i}{6} =$$

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$$3. \quad \frac{6+9i}{3} = \frac{6}{3} + \frac{9i}{3} = 2 + 3i$$

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Division problems are written using fraction notation.  $\frac{n}{d} = n \div d$ .

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$$3. \quad \frac{6+9i}{3} = \frac{6}{3} + \frac{9i}{3} = 2 + 3i$$

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$$3. \quad \frac{6+9i}{3} = \frac{6}{3} + \frac{9i}{3} = 2 + 3i$$

$$4. \quad \frac{4-9i}{6} = \frac{4}{6} - \frac{9i}{6} = \frac{2}{3} - \frac{3}{2}i$$

Division problems are written using fraction notation.  $\frac{n}{d} = n \div d$ .

**These problems involve dividing a complex number by a real number. In problems like these, the number  $i$  is treated as a variable. Simply divide both terms of the complex number by the real number.**

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$$3. \quad \frac{6+9i}{3} = \frac{6}{3} + \frac{9i}{3} = 2 + 3i \qquad 4. \quad \frac{4-9i}{6} = \frac{4}{6} - \frac{9i}{6} = \frac{2}{3} - \frac{3}{2}i$$

Division problems are written using fraction notation.  $\frac{n}{d} = n \div d$ .

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Perform the indicated operations. Express complex answers in  $a + bi$  form.

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Perform the indicated operations. Express complex answers in  $a + bi$  form.

5.  $\frac{4 - 8i}{4i} =$

6.  $\frac{4 - 2i}{-2i} =$

Division problems are written using fraction notation.  $\frac{n}{d} = n \div d$ .



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Perform the indicated operations. Express complex answers in  $a + bi$  form.

$$5. \quad \frac{4 - 8i}{4i} =$$

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These problems involve dividing a complex number by an imaginary number.

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$$5. \quad \frac{4 - 8i}{4i} =$$

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Division problems are written using fraction notation.  $\frac{n}{d} = n \div d$ .

These problems involve dividing a complex number by an imaginary number. In problems like these, you must make the divisor a real number.

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$$5. \quad \frac{4 - 8i}{4i} =$$

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Division problems are written using fraction notation.  $\frac{n}{d} = n \div d$ .

These problems involve dividing a complex number by an imaginary number. In problems like these, you must make the divisor a real number. Multiply both terms of the fraction by  $i$  and simplify the resulting expressions.

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Perform the indicated operations. Express complex answers in  $a + bi$  form.

$$5. \quad \frac{4 - 8i}{4i} = \frac{i(4 - 8i)}{4i^2} =$$

$$6. \quad \frac{4 - 2i}{-2i} =$$

Division problems are written using fraction notation.  $\frac{n}{d} = n \div d$ .

These problems involve dividing a complex number by an imaginary number. In problems like these, you must make the divisor a real number. Multiply both terms of the fraction by  $i$  and simplify the resulting expressions.

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Division problems are written using fraction notation.  $\frac{n}{d} = n \div d$ .

These problems involve dividing a complex number by an imaginary number. In problems like these, you must make the divisor a real number. Multiply both terms of the fraction by  $i$  and simplify the resulting expressions. Remember that  $i^2 = -1$ .

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Perform the indicated operations. Express complex answers in  $a + bi$  form.

$$5. \quad \frac{4 - 8i}{4i} = \frac{i(4 - 8i)}{4i^2} =$$
$$= \frac{\quad}{-4}$$

$$6. \quad \frac{4 - 2i}{-2i} =$$

Division problems are written using fraction notation.  $\frac{n}{d} = n \div d$ .

These problems involve dividing a complex number by an imaginary number. In problems like these, you must make the divisor a real number. Multiply both terms of the fraction by  $i$  and simplify the resulting expressions. Remember that  $i^2 = -1$ .



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Perform the indicated operations. Express complex answers in  $a + bi$  form.

$$\begin{aligned} 5. \quad \frac{4 - 8i}{4i} &= \frac{i(4 - 8i)}{4i^2} = \\ &= \frac{4i - 8i^2}{-4} \end{aligned}$$

$$6. \quad \frac{4 - 2i}{-2i} =$$

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7.  $\frac{5 + 6i}{-3i} =$

8.  $\frac{3 + 7i}{3i} =$

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$$\begin{aligned} 7. \quad \frac{5 + 6i}{-3i} &= \frac{i(5 + 6i)}{-3i^2} = \\ &= \frac{5i + 6i^2}{3} = \frac{5i - 6}{3} = \\ &= \frac{-6 + 5i}{3} = \end{aligned}$$

$$8. \quad \frac{3 + 7i}{3i} =$$

Division problems are written using fraction notation.  $\frac{n}{d} = n \div d$ .

These problems involve dividing a complex number by an imaginary number. In problems like these, you must make the divisor a real number. Multiply both terms of the fraction by  $i$  and simplify the resulting expressions. Remember that  $i^2 = -1$ . Express the complex number in the numerator in  $a + bi$  form and complete the division.

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$$\begin{aligned} 8. \quad \frac{3 + 7i}{3i} &= \frac{i(3 + 7i)}{3i^2} = \\ &= \frac{-3}{-3} \end{aligned}$$

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$$\begin{aligned} 8. \quad \frac{3 + 7i}{3i} &= \frac{i(3 + 7i)}{3i^2} = \\ &= \frac{3i + 7i^2}{-3} = \frac{-7 + 3i}{-3} \end{aligned}$$

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Division problems are written using fraction notation.  $\frac{n}{d} = n \div d$ .

These problems involve dividing a complex number by an imaginary number. In problems like these, you must make the divisor a real number. Multiply both terms of the fraction by  $i$  and simplify the resulting expressions. Remember that  $i^2 = -1$ . Express the complex number in the numerator in  $a + bi$  form and complete the division.

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Division problems are written using fraction notation.  $\frac{n}{d} = n \div d$ .

These problems involve dividing a complex number by an imaginary number. In problems like these, you must make the divisor a real number. Multiply both terms of the fraction by  $i$  and simplify the resulting expressions. Remember that  $i^2 = -1$ . Express the complex number in the numerator in  $a + bi$  form and complete the division. A complex number divided by an imaginary number is a complex number.

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Perform the indicated operations. Express complex answers in  $a + bi$  form.

9.  $\frac{6 + 17i}{4 + 3i} =$

10.  $\frac{17 + i}{3 - i} =$

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These problems involve dividing a complex number by a complex number.



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Division problems are written using fraction notation.  $\frac{n}{d} = n \div d$ .

These problems involve dividing a complex number by a complex number. In problems like these, you must make the divisor a real number.

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Division problems are written using fraction notation.  $\frac{n}{d} = n \div d$ .

These problems involve dividing a complex number by a complex number. In problems like these, you must make the divisor a real number. Multiply both terms of the fraction by the complex conjugate of the divisor

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$a + bi$

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$$9. \frac{6 + 17i}{4 + 3i} =$$

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$a + bi$  and  $a - bi$  are complex conjugates of each other.

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$a + bi$  and  $a - bi$  are complex conjugates of each other. The product of a complex number and its complex conjugate is always a real number.

Division problems are written using fraction notation.  $\frac{n}{d} = n \div d$ .

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$a + bi$  and  $a - bi$  are complex conjugates of each other. The product of a complex number and its complex conjugate is always a real number.

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## General Algebra II Class Worksheet #5 Unit 7

Perform the indicated operations. Express complex answers in  $a + bi$  form.

$$9. \frac{6 + 17i}{4 + 3i} = \frac{\quad}{(4 + 3i)(4 - 3i)}$$

$$10. \frac{17 + i}{3 - i} =$$

$a + bi$  and  $a - bi$  are complex conjugates of each other. The product of a complex number and its complex conjugate is always a real number.

Division problems are written using fraction notation.  $\frac{n}{d} = n \div d$ .

These problems involve dividing a complex number by a complex number. In problems like these, you must make the divisor a real number. Multiply both terms of the fraction by the complex conjugate of the divisor

## General Algebra II Class Worksheet #5 Unit 7

Perform the indicated operations. Express complex answers in  $a + bi$  form.

$$9. \quad \frac{6 + 17i}{4 + 3i} = \frac{(6 + 17i)(4 - 3i)}{(4 + 3i)(4 - 3i)}$$

$$10. \quad \frac{17 + i}{3 - i} =$$

$a + bi$  and  $a - bi$  are complex conjugates of each other. The product of a complex number and its complex conjugate is always a real number.

Division problems are written using fraction notation.  $\frac{n}{d} = n \div d$ .

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Perform the indicated operations. Express complex answers in  $a + bi$  form.

$$9. \quad \frac{6 + 17i}{4 + 3i} = \frac{(6 + 17i)(4 - 3i)}{(4 + 3i)(4 - 3i)} =$$
$$=$$

$$10. \quad \frac{17 + i}{3 - i} =$$


$a + bi$  and  $a - bi$  are complex conjugates of each other. The product of a complex number and its complex conjugate is always a real number.

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$$9. \quad \frac{6 + 17i}{4 + 3i} = \frac{(6 + 17i)(4 - 3i)}{(4 + 3i)(4 - 3i)} =$$

$$= \underline{\hspace{2cm}}$$

$$10. \quad \frac{17 + i}{3 - i} =$$


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$$9. \quad \frac{6 + 17i}{4 + 3i} = \frac{(6 + 17i)(4 - 3i)}{(4 + 3i)(4 - 3i)} =$$

$$= \frac{\quad}{16}$$

$$10. \quad \frac{17 + i}{3 - i} =$$


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$$= \frac{\quad}{16}$$

$$10. \quad \frac{17 + i}{3 - i} =$$


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$$9. \quad \frac{6 + 17i}{4 + 3i} = \frac{(6 + 17i)(4 - 3i)}{(4 + 3i)(4 - 3i)} =$$

$$= \frac{\quad}{16 - 12i}$$

$$10. \quad \frac{17 + i}{3 - i} =$$

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$$\begin{aligned} 9. \quad \frac{6 + 17i}{4 + 3i} &= \frac{(6 + 17i)(4 - 3i)}{(4 + 3i)(4 - 3i)} = \\ &= \frac{\quad\quad\quad}{16 - 12i} \end{aligned}$$


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11.  $\frac{-13 - 13i}{2 - 3i} =$

12.  $\frac{22 - 7i}{3 + 2i} =$

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$$11. \quad \frac{-13 - 13i}{2 - 3i} = \frac{(-13 - 13i)(2 + 3i)}{(2 - 3i)(2 + 3i)} =$$

$$= \frac{4 + 6i - 6i - 9i^2}{4 + 6i - 6i - 9i^2}$$

$$12. \quad \frac{22 - 7i}{3 + 2i} =$$

$a + bi$  and  $a - bi$  are complex conjugates of each other. The product of a complex number and its complex conjugate is always a real number.

Division problems are written using fraction notation.  $\frac{n}{d} = n \div d$ .

These problems involve dividing a complex number by a complex number. In problems like these, you must make the divisor a real number. Multiply both terms of the fraction by the complex conjugate of the divisor and simplify the resulting expressions.

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$$= \frac{4 + 6i - 6i - 9i^2}{13}$$

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$$\begin{aligned} 11. \quad \frac{-13 - 13i}{2 - 3i} &= \frac{(-13 - 13i)(2 + 3i)}{(2 - 3i)(2 + 3i)} = \\ &= \frac{-26}{4 + 6i - 6i - 9i^2} \end{aligned}$$

$$12. \quad \frac{22 - 7i}{3 + 2i} =$$

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$$\begin{aligned} 11. \quad \frac{-13 - 13i}{2 - 3i} &= \frac{(-13 - 13i)(2 + 3i)}{(2 - 3i)(2 + 3i)} = \\ &= \frac{-26}{4 + 6i - 6i - 9i^2} \end{aligned}$$

$$12. \quad \frac{22 - 7i}{3 + 2i} =$$

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$$\begin{aligned} 11. \quad \frac{-13 - 13i}{2 - 3i} &= \frac{(-13 - 13i)(2 + 3i)}{(2 - 3i)(2 + 3i)} = \\ &= \frac{-26 - 39i}{4 + 6i - 6i - 9i^2} \end{aligned}$$

$$12. \quad \frac{22 - 7i}{3 + 2i} =$$

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$$11. \quad \frac{-13 - 13i}{2 - 3i} = \frac{(-13 - 13i)(2 + 3i)}{(2 - 3i)(2 + 3i)} =$$
$$= \frac{-26 - 39i}{4 + 6i - 6i - 9i^2}$$

$$12. \quad \frac{22 - 7i}{3 + 2i} =$$

$a + bi$  and  $a - bi$  are complex conjugates of each other. The product of a complex number and its complex conjugate is always a real number.

Division problems are written using fraction notation.  $\frac{n}{d} = n \div d$ .

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## General Algebra II Class Worksheet #5 Unit 7

Perform the indicated operations. Express complex answers in a + bi form.

$$11. \quad \frac{-13 - 13i}{2 - 3i} = \frac{(-13 - 13i)(2 + 3i)}{(2 - 3i)(2 + 3i)} =$$
$$= \frac{-26 - 39i - 26i}{4 + 6i - 6i - 9i^2}$$

$$12. \quad \frac{22 - 7i}{3 + 2i} =$$

**a + bi and a – bi are complex conjugates of each other. The product of a complex number and its complex conjugate is always a real number.**

**Division problems are written using fraction notation.  $\frac{n}{d} = n \div d$ .**

**These problems involve dividing a complex number by a complex number. In problems like these, you must make the divisor a real number. Multiply both terms of the fraction by the complex conjugate of the divisor and simplify the resulting expressions.**

## General Algebra II Class Worksheet #5 Unit 7

Perform the indicated operations. Express complex answers in  $a + bi$  form.

$$\begin{aligned} 11. \quad \frac{-13 - 13i}{2 - 3i} &= \frac{(-13 - 13i)(2 + 3i)}{(2 - 3i)(2 + 3i)} = \\ &= \frac{-26 - 39i - 26i}{4 + 6i - 6i - 9i^2} \end{aligned}$$

$$12. \quad \frac{22 - 7i}{3 + 2i} =$$

$a + bi$  and  $a - bi$  are complex conjugates of each other. The product of a complex number and its complex conjugate is always a real number.

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$$11. \quad \frac{-13 - 13i}{2 - 3i} = \frac{(-13 - 13i)(2 + 3i)}{(2 - 3i)(2 + 3i)} =$$
$$= \frac{-26 - 39i - 26i - 39i^2}{4 + 6i - 6i - 9i^2}$$

$$12. \quad \frac{22 - 7i}{3 + 2i} =$$

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$$\begin{aligned} 11. \quad \frac{-13 - 13i}{2 - 3i} &= \frac{(-13 - 13i)(2 + 3i)}{(2 - 3i)(2 + 3i)} = \\ &= \frac{-26 - 39i - 26i - 39i^2}{4 + 6i - 6i - 9i^2} = \\ &= \underline{\hspace{2cm}} \end{aligned}$$

$$12. \quad \frac{22 - 7i}{3 + 2i} =$$

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$$\begin{aligned} 11. \quad \frac{-13 - 13i}{2 - 3i} &= \frac{(-13 - 13i)(2 + 3i)}{(2 - 3i)(2 + 3i)} = \\ &= \frac{-26 - 39i - 26i - 39i^2}{4 + 6i - 6i - 9i^2} = \\ &= \frac{-26 - 65i - 39(-1)}{4 - 9(-1)} = \end{aligned}$$

$$12. \quad \frac{22 - 7i}{3 + 2i} =$$

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Perform the indicated operations. Express complex answers in  $a + bi$  form.

$$\begin{aligned} 11. \quad \frac{-13 - 13i}{2 - 3i} &= \frac{(-13 - 13i)(2 + 3i)}{(2 - 3i)(2 + 3i)} = \\ &= \frac{-26 - 39i - 26i - 39i^2}{4 + 6i - 6i - 9i^2} = \\ &= \frac{-26 - 65i - 39(-1)}{4 - 9(-1)} = \\ &= \frac{-26 - 65i + 39}{4 + 9} = \\ &= \frac{13 - 65i}{13} \end{aligned}$$

$$12. \quad \frac{22 - 7i}{3 + 2i} =$$

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$$\begin{aligned} 11. \quad \frac{-13 - 13i}{2 - 3i} &= \frac{(-13 - 13i)(2 + 3i)}{(2 - 3i)(2 + 3i)} = \\ &= \frac{-26 - 39i - 26i - 39i^2}{4 + \underset{\uparrow}{6i} - \underset{\uparrow}{6i} - 9i^2} = \\ &= \frac{\quad}{13} \end{aligned}$$

$$12. \quad \frac{22 - 7i}{3 + 2i} =$$

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$$\begin{aligned} 11. \quad \frac{-13 - 13i}{2 - 3i} &= \frac{(-13 - 13i)(2 + 3i)}{(2 - 3i)(2 + 3i)} = \\ &= \frac{-26 - 39i - 26i - 39i^2}{4 + \underset{\uparrow}{6i} - \underset{\uparrow}{6i} - 9i^2} = \\ &= \frac{-26 - 65i + 39}{13 + 0i} \end{aligned}$$

$$12. \quad \frac{22 - 7i}{3 + 2i} =$$

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$$\begin{aligned} 11. \quad \frac{-13 - 13i}{2 - 3i} &= \frac{(-13 - 13i)(2 + 3i)}{(2 - 3i)(2 + 3i)} = \\ &= \frac{-26 - 39i - 26i - 39i^2}{4 + 6i - 6i - 9i^2} = \\ &= \frac{13}{1} \end{aligned}$$

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$$12. \quad \frac{22 - 7i}{3 + 2i} =$$

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$$12. \quad \frac{22 - 7i}{3 + 2i} =$$

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$$12. \quad \frac{22 - 7i}{3 + 2i} =$$

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$$12. \quad \frac{22 - 7i}{3 + 2i} =$$

$a + bi$  and  $a - bi$  are complex conjugates of each other. The product of a complex number and its complex conjugate is always a real number.

Division problems are written using fraction notation.  $\frac{n}{d} = n \div d$ .

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$$\begin{aligned} 11. \quad \frac{-13 - 13i}{2 - 3i} &= \frac{(-13 - 13i)(2 + 3i)}{(2 - 3i)(2 + 3i)} = & 12. \quad \frac{22 - 7i}{3 + 2i} &= \\ &= \frac{-26 - 39i - 26i - 39i^2}{4 + 6i - 6i - 9i^2} = & & \\ &= \frac{13 - 65i}{13} = 1 - 5i & & \end{aligned}$$

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$$12. \quad \frac{22 - 7i}{3 + 2i} = \frac{\quad}{(3 + 2i)(3 - 2i)}$$

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$$12. \quad \frac{22 - 7i}{3 + 2i} = \frac{(22 - 7i)(3 - 2i)}{(3 + 2i)(3 - 2i)}$$

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## General Algebra II Class Worksheet #5 Unit 7

Perform the indicated operations. Express complex answers in a + bi form.

$$\begin{aligned} 11. \quad \frac{-13 - 13i}{2 - 3i} &= \frac{(-13 - 13i)(2 + 3i)}{(2 - 3i)(2 + 3i)} = \\ &= \frac{-26 - 39i - 26i - 39i^2}{4 + 6i - 6i - 9i^2} = \\ &= \frac{13 - 65i}{13} = 1 - 5i \end{aligned}$$

$$\begin{aligned} 12. \quad \frac{22 - 7i}{3 + 2i} &= \frac{(22 - 7i)(3 - 2i)}{(3 + 2i)(3 - 2i)} = \\ &= \frac{66 - 44i - 21i + 14i^2}{9 - 6i + 6i - 4i^2} = \\ &= \frac{\quad}{13} \end{aligned}$$

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Perform the indicated operations. Express complex answers in  $a + bi$  form.

13.  $\frac{3 + 5i}{1 - 2i} =$

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

$a + bi$  and  $a - bi$  are complex conjugates of each other. The product of a complex number and its complex conjugate is always a real number.

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$$13. \frac{3 + 5i}{1 - 2i} = \frac{\quad}{(1 - 2i)(1 + 2i)}$$

$$14. \frac{4 - i}{1 + 3i} =$$

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$$13. \quad \frac{3 + 5i}{1 - 2i} = \frac{(3 + 5i)(1 + 2i)}{(1 - 2i)(1 + 2i)}$$

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$$= \underline{\hspace{2cm}}$$

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$$= \frac{\quad}{1}$$

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$$13. \quad \frac{3 + 5i}{1 - 2i} = \frac{(3 + 5i)(1 + 2i)}{(1 - 2i)(1 + 2i)} =$$
$$= \frac{3 + 6i + 5i + 10i^2}{1 + 2i - 2i - 4i^2}$$

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$$\begin{aligned} 13. \quad \frac{3 + 5i}{1 - 2i} &= \frac{(3 + 5i)(1 + 2i)}{(1 - 2i)(1 + 2i)} = \\ &= \frac{\underset{\uparrow}{3} + 6i + 5i + \underset{\uparrow}{10i^2}}{1 + 2i - 2i - 4i^2} = \\ &= \underline{\hspace{2cm}} \end{aligned}$$

$$14. \quad \frac{4 - i}{1 + 3i} =$$

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$$\begin{aligned} 13. \quad \frac{3 + 5i}{1 - 2i} &= \frac{(3 + 5i)(1 + 2i)}{(1 - 2i)(1 + 2i)} = \\ &= \frac{\underset{\uparrow}{3} + \underset{\uparrow}{6i} + 5i + 10i^2}{1 + 2i - 2i - 4i^2} = \\ &= \frac{5}{5} \end{aligned}$$

$$14. \quad \frac{4 - i}{1 + 3i} =$$

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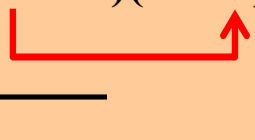
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$$\begin{aligned} 13. \quad \frac{3 + 5i}{1 - 2i} &= \frac{(3 + 5i)(1 + 2i)}{(1 - 2i)(1 + 2i)} = \\ &= \frac{3 + 6i + 5i + 10i^2}{1 + 2i - 2i - 4i^2} = \\ &= \frac{-7 + 11i}{5} = \frac{-7}{5} + \frac{11}{5}i \end{aligned}$$

$$\begin{aligned} 14. \quad \frac{4 - i}{1 + 3i} &= \frac{(4 - i)(1 - 3i)}{(1 + 3i)(1 - 3i)} = \\ &= \frac{4 - 12i - i + 3i^2}{1 - 3i + 3i - 9i^2} = \\ &= \frac{1 - 13i}{10} = \frac{1}{10} - \frac{13}{10}i \end{aligned}$$

$a + bi$  and  $a - bi$  are complex conjugates of each other. The product of a complex number and its complex conjugate is always a real number.

Division problems are written using fraction notation.  $\frac{n}{d} = n \div d$ .



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$$16. \quad \frac{-2}{3-i} =$$

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$$\begin{aligned} 16. \quad \frac{-2}{3-i} &= \frac{-2(3+i)}{(3-i)(3+i)} = \\ &= \frac{-6-2i}{9+3i-3i-i^2} = \\ &= \frac{-6-2i}{10} = \frac{-3}{5} \end{aligned}$$

$a + bi$  and  $a - bi$  are complex conjugates of each other. The product of a complex number and its complex conjugate is always a real number.

Division problems are written using fraction notation.  $\frac{n}{d} = n \div d$ .

These problems involve dividing a real number by a complex number. In problems like these, you must make the divisor a real number. Multiply both terms of the fraction by the complex conjugate of the divisor and simplify the resulting expressions. Remember that  $i^2 = -1$ . Now that the divisor is a real number, you can complete the division process.

## General Algebra II Class Worksheet #5 Unit 7

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$$17. \quad \frac{5i}{1+2i} = \frac{5i(1-2i)}{(1+2i)(1-2i)} =$$

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## General Algebra II Class Worksheet #5 Unit 7

Perform the indicated operations. Express complex answers in a + bi form.

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$$= \frac{5i}{1-2i+2i-4i^2}$$

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$$\begin{aligned} 17. \quad \frac{5i}{1+2i} &= \frac{5i(1-2i)}{(1+2i)(1-2i)} = \\ &= \frac{5i - 10i^2}{1 - 2i + 2i - 4i^2} = \frac{5i + 10}{5} = \\ &= \frac{10 + 5i}{5} = 2 + i \end{aligned}$$

$$\begin{aligned} 18. \quad \frac{-2i}{3-i} &= \frac{-2i(3+i)}{(3-i)(3+i)} = \\ &= \frac{-6i - 2i^2}{9 + 3i - 3i - i^2} = \frac{10 + 0i}{10 + 0i} \end{aligned}$$

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**Write the multiplicative inverse of each of the following using a + bi form.**

**19.  $4 + 3i$**

**20.  $3 - i$**

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$$\frac{1}{4 + 3i} =$$

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$$\frac{1}{4 + 3i} = \frac{\quad}{(4 + 3i)(4 - 3i)}$$

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$$\frac{1}{4 + 3i} = \frac{1(4 - 3i)}{(4 + 3i)(4 - 3i)} =$$

$$= \frac{1}{16}$$


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$$\frac{1}{4 + 3i} = \frac{1(4 - 3i)}{(4 + 3i)(4 - 3i)} =$$

$$= \frac{16 - 12i}{16 - 12i}$$


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$$\frac{1}{4 + 3i} = \frac{1(4 - 3i)}{(4 + 3i)(4 - 3i)} =$$

$$= \frac{4 - 3i}{16 - 12i + 12i}$$


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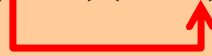
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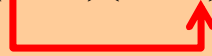
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