

Student: _____
Date: _____

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Course: Math1111-Summer2018

Assignment: Section 1A Homework

Note: $i^2 = -1$ in this problems

1. Write the expression in the standard form $a + bi$.

$$(4 - 4i) + (2 + 7i) = 6 + 3i$$

$$(4 - 4i) + (2 + 7i) = \underline{6 + 3i} \quad (\text{Simplify your answer.})$$

2. Write the expression in the standard form $a + bi$.

$$(3 + 5i) - (7 - 2i) = 3 + 5i - 7 + 2i = -4 + 7i$$

$$(3 + 5i) - (7 - 2i) = \underline{-4 + 7i} \quad (\text{Simplify your answer.})$$

3. Multiply.

$$6i(3 - 7i) = 18i - 42i^2 \quad \begin{matrix} \uparrow \\ \text{since } i^2 = -1 \end{matrix} \Rightarrow 18i - 42(-1) = 18i + 42 \text{ or } 42 + 18i$$

$$6i(3 - 7i) = \underline{42 + 18i}$$

(Type your answer in the form $a + bi$. Use integers or fractions for any numbers in the expression.)

4. Find the following product and write the result in standard form, $a + bi$.

$$(-9 + 3i)(5 + i) = -45 - 9i + 15i + 3i^2 = 6i - 45 + 3(-1) = 6i - 48 \text{ or } -48 + 6i$$

$$(-9 + 3i)(5 + i) = \underline{-48 + 6i}$$

5. Find the product.

$$(3 - 7i)(6 - 5i) = 18 - 15i - 42i + 35i^2 = 18 + 35(-1) - 57i = -17 - 57i$$

$$(3 - 7i)(6 - 5i) = \underline{-17 - 57i}$$

(Simplify your answer. Type your answer in the form $a + bi$.)

6. Divide and express the result in standard form. *rationalize.*

$$\frac{9i}{7-5i} \cdot \frac{7+5i}{7+5i} = \frac{9i(7+5i)}{(7)^2 - (5i)^2} = \frac{63i + 45i^2}{49 - (-25)} = \frac{45(-1) + 63i}{74} = \frac{-45 + 63i}{74}$$

$$\frac{9i}{7-5i} = \underline{-\frac{45}{74} + \frac{63i}{74}}$$

$$= \frac{-45}{74} + \frac{63i}{74}$$

(Simplify your answer. Type your answer in the form $a + bi$. Use integers or fractions for any numbers in the expression.)

7. Divide the following complex numbers and express the result in standard form $a + bi$, where a and b are fractions in lowest terms.

$$\frac{4+3i}{3+2i} \cdot \frac{3-2i}{3-2i} = \frac{12-8i+9i-6i^2}{(3)^2-(2i)^2} = \frac{12-8i+9i-6(-1)}{9-(-4)} = \frac{12+6+i}{13} = \frac{18+i}{13}$$

$$\frac{4+3i}{3+2i} = \underline{\frac{18}{13} + \frac{1}{13}i}$$

$$= \frac{18}{13} + \frac{1}{13}i$$

8. Perform the indicated operation and write the result in standard form.

$$\sqrt{-25} - \sqrt{-4}$$

$$\sqrt{-25} - \sqrt{-4} = \underline{3i}$$

(Simplify your answer. Express complex numbers in terms of i . Type an exact answer, using radicals as needed.)

$$\sqrt{-25} - \sqrt{-4} = \sqrt{-1}25 - \sqrt{-1}4$$

$$= \sqrt{i^2 25} - \sqrt{i^2 4} = 5i - 2i = \boxed{3i}$$

$1. 6+3i$

$2. -4+7i$

$3. 42+18i$

$4. -48+6i$

$5. -17-57i$

$6. -\frac{45}{74} + \frac{63}{74}i$

$7. \frac{18}{13} + \frac{1}{13}i$

$8. 3i$
