

SHOW ALL WORK!

1. Subtract. Write the result in standard form.

$$(-4 - 10i) - (-1 - 4i)$$

A. $-3 - 6i$

C. $3 - 14i$

B. $-17i$

D. $-9i$

$$-4 - 10i + 1 + 4i$$

$$-3 - 6i$$

2. Multiply. Write the result in standard form.

$$2i(5 + 6i)$$

A. $16i$

C. $-2i$

B. $-12 + 10i$

D. $12 + 10i$

$$10i + 12i^2$$

$$-12 + 10i$$

3. Multiply. Write the result in standard form.

$$(4 - 6i)(4 + 6i)$$

A. $-20 - 48i$

C. $52 + 48i$

B. -20

D. 52

$$16 - 36i^2$$

$$16 + 36$$

$$52$$

4. Divide and write your answer in standard form.

$$\frac{11}{4 + 3i}$$

A. $\frac{11}{4} + \frac{11}{3}i$

C. $\frac{44}{25} - \frac{33}{25}i$

B. $\frac{44}{7} - \frac{3}{7}i$

D. $\frac{44}{25} - \frac{3}{25}i$

$$\frac{11}{4+3i} \cdot \frac{4-3i}{4-3i}$$

$$\frac{44 - 33i}{16 - 9i^2}$$

$$\frac{44 - 33i}{16 + 9}$$

$$\frac{44 - 33i}{25}$$

5. Divide and write your answer in standard form.

$$\frac{8 - 3i}{8 + 3i}$$

A. $\frac{73}{55} - \frac{48}{55}i$

C. $1 - \frac{48}{55}i$

B. $\frac{55}{73} - \frac{48}{73}i$

D. $1 - \frac{48}{73}i$

$$\frac{8-3i}{8+3i} \cdot \frac{8-3i}{8-3i}$$

$$\frac{64 - 48i + 9i^2}{64 - 9i^2}$$

$$\frac{64 - 48i - 9}{64 + 9}$$

$$\frac{55 - 48i}{73}$$

$$64 + 9$$

$$\frac{55 - 48i}{73}$$

6. Evaluate and write your answer in standard form. $\sqrt{-96} \cdot \sqrt{-6}$

- A. -24
C. 24

- B. $24i$
D. $-24i$

$$\begin{aligned} & i\sqrt{96} \cdot i\sqrt{6} \\ & \quad \uparrow \\ & \quad 16 \cdot 6 \\ & 4i\sqrt{6} \cdot i\sqrt{6} \\ & \quad \quad \quad \uparrow \\ & \quad \quad \quad 24i^2 \end{aligned}$$

7. Convert imaginary numbers to standard form, perform the indicated operation, and express the answer in standard form.

$$(5 - \sqrt{-9})(-2 + \sqrt{-49})$$

- A. $-31 - 41i$
C. $-31 + 41i$

- B. $11 - 41i$
D. $11 + 41i$

$$\begin{aligned} & (5 - 3i)(-2 + 7i) \\ & -10 + 6i + 35i - 21i^2 \\ & -10 + 41i + 21 \\ & 11 + 41i \end{aligned}$$

8. Convert imaginary numbers to standard form, perform the indicated operation, and express the answer in standard form.

$$\frac{9 - \sqrt{-81}}{9}$$

- A. $1 + i$
C. $1 - i$

- B. $1 + 81i$
D. $1 - 81i$

$$\begin{aligned} & \frac{9 - 9i}{9} \\ & 1 - i \end{aligned}$$

9. Divide and write your answer in standard form.

$$\frac{-5 - 4i}{i}$$

- A. $-4 - 5i$
C. $4 - 5i$

- B. $-4 + 5i$
D. $4 + 5i$

$$\begin{aligned} & \frac{-5 - 4i}{i} \cdot \frac{i}{i} \\ & \frac{-5i - 4i^2}{i^2} \\ & \frac{-5i + 4}{-1} \\ & -4 + 5i \end{aligned}$$

10. Solve for x and y .

$$\frac{(4+x) + (y+3)i}{2-i} = 3+i$$

- A. $x=2, y=-4$
C. $x=1, y=-2$

- B. $x=3, y=-4$
D. $x=1, y=-4$

$$\begin{aligned} & (4+x) + (y+3)i = (3+i)(2-i) \\ & (4+x) + (y+3)i = 6 + 2i - 3i - i^2 \\ & (4+x) + (y+3)i = 7 - i \end{aligned}$$

$$\begin{aligned} 4+x &= 7 & y+3 &= -1 \\ x &= 3 & y &= -4 \end{aligned}$$

11. Solve. Express your answer in standard form.

$$(3+i)z + 2i = 6i$$

A. $\frac{2}{5} - \frac{6}{5}i$

C. $-\frac{2}{5} - \frac{6}{5}i$

B. $\frac{2}{5} + \frac{6}{5}i$

D. $-\frac{2}{5} + \frac{6}{5}i$

$$\begin{aligned} & (3+i)z = 4i \\ & z = \frac{4i}{3+i} \cdot \frac{3-i}{3-i} \end{aligned}$$

$$z = \frac{12i - 4i^2}{9 - i^2}$$

$$z = \frac{12i + 4}{9 + 1}$$

$$z = \frac{4 + 12i}{10} = \frac{2}{5} + \frac{6}{5}i$$