

Algebra 2

Ch. 5 Handout 5.6

Complex Numbers

Adding Complex Numbers

8. Simplify the expression $(3 + 6i) - (4 - 8i)$

$$\underline{3} + \underline{6i} - \underline{4} + \underline{8i}$$

$$\boxed{-1 + 14i}$$

Multiplying Complex Numbers

9. a. Find $(3i)(8i)$

$$= 24i^2$$

$$= 24 \cdot -1$$

$$= \boxed{-24}$$

b. $(3 - 7i)(2 - 4i)$

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

$$6 + \underline{-12i} + \underline{-14i} + 28i^2$$

$$28(-1)$$

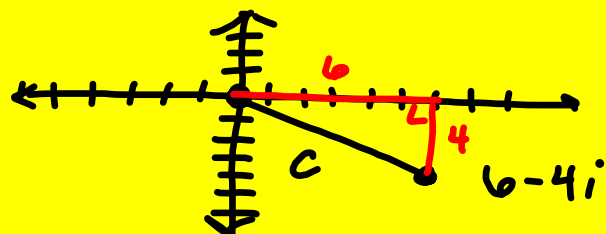
$$\underline{6} - 26i - \underline{28}$$

$$\boxed{-22 - 26i}$$

10. Find the absolute value of each complex number.

↳ distance from origin to complex #

a) $|6 - 4i| = 2\sqrt{13}$



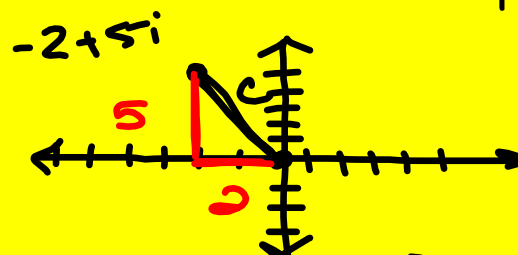
$$6^2 + 4^2 = c^2$$

$$36 + 16 = c^2$$

$$\sqrt{c^2} = \sqrt{52}$$

$$c = \sqrt{4 \cdot 13} = 2\sqrt{13}$$

b) $|-2 + 5i| = \sqrt{29}$



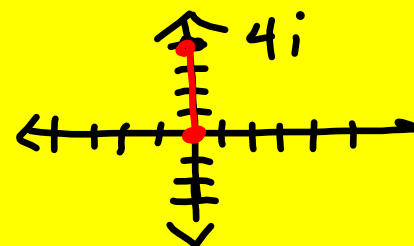
$$c^2 = 2^2 + 5^2$$

$$c^2 = 4 + 25$$

$$\sqrt{c^2} = \sqrt{29}$$

$$c = \sqrt{29}$$

c) $|4i| = 4$



11. Simplify each expression.

$$\text{a) } (8 + 3i) - (2 + 4i)$$

$$\underline{8} + \underline{3i} - \underline{2} - \underline{4i}$$

$$\boxed{6 - i}$$

$$\text{b) } 7 - (3 + 2i)$$

$$\underline{7} - \underline{3} - 2i$$

$$\boxed{4 - 2i}$$

$$\text{c) } (4 - 6i) + 3i = 4 - \underline{6i} + \underline{3i} = \boxed{4 - 3i}$$

12. Simplify each expression.

a) $(12i)(7i)$

$$84i^2$$

$$84 \cdot -1$$

$$\boxed{-84}$$

b) $(6-5i)(4-3i)$

$$6(4) + 6(-3i) - 5i(4) - 5i(-3i)$$

$$24 - \underline{18i} - \underline{20i} + \underline{15i^2}$$

$$15(-1)$$

$$\underline{24} - 38i - \underline{15}$$

$$\boxed{9-38i}$$

c) $(4-9i)(4+3i)$

$$16 + \underline{12i} - \underline{36i} - \underline{27i^2}$$

$$(-27)$$

$$\underline{16} - 24i + \underline{27} = \boxed{43-24i}$$

Finding Complex Solutions

13. Solve $9x^2 + 54 = 0$

$$\frac{9x^2}{9} = \frac{-54}{9}$$

$$\sqrt{x^2} = \pm \sqrt{-6}$$

$$x = \pm \sqrt{-1 \cdot 6} = \pm \sqrt{-1} \sqrt{6}$$

$$\boxed{x = \pm i\sqrt{6}}$$

15. Solve for x.

a) $3x^2 + 48 = 0$

$$\frac{3x^2}{3} = -\frac{48}{3}$$

$$\sqrt{x^2} = \pm \sqrt{-16}$$

$$x = \pm \sqrt{-1 \cdot 16} = \pm \sqrt{-1} \sqrt{16}$$

$$\boxed{x = \pm 4i}$$

b) $-5x^2 - 150 = 0$

$$\frac{-5x^2}{-5} = \frac{150}{-5}$$

$$\sqrt{x^2} = \pm \sqrt{-30}$$

$$\pm \sqrt{-1 \cdot 30}$$

$$\boxed{x = \pm i \sqrt{30}}$$

c) $8x^2 + 1 = 0$

$$8x^2 = -1$$

$$\sqrt{x^2} = \pm \sqrt{-\frac{1}{8}}$$

$$\boxed{x = \pm \frac{i\sqrt{2}}{4}}$$

$$x = \pm \frac{\sqrt{-1}}{\sqrt{8}} = \pm \frac{i}{\sqrt{4 \cdot 2}} = \pm \frac{i \sqrt{2}}{2 \sqrt{2} \sqrt{2}} = \pm \frac{i \sqrt{2}}{4}$$

Simplify each expression.

17. $(-7i)(-3i)$

18. $(9 + 10i) + (-7 + 4i)$

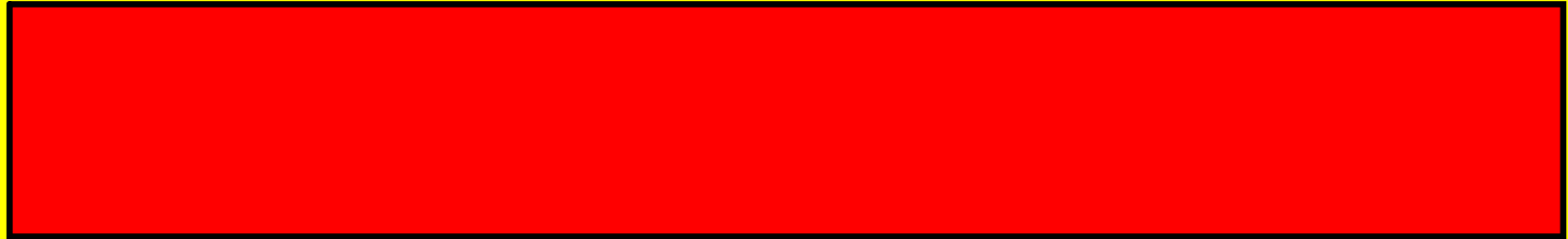
Simplify each expression.

19. $(-3 + 4i) - (-3 - 8i)$

20. $(-5 + 2i)(7 - 4i)$

21. Solve: $\frac{1}{2}x^2 + 2 = 0$

Assignment:



Day 2: pgs 278-280 29-52, 57-66,
68-70,77,78