

Name: _____ Date: 8/20/19 Period: _____

1.6 Operations with Complex Numbers Practice

Exercises: Show work for all problems. Box answers.

Simplify.

1. $\sqrt{-72}$

2. $\sqrt{-24}$

3. $\sqrt{-84}$

4. $(2+i)(2-i)$

Solve each equation.

5. $5x^2 + 45 = 0$

6. $4x^2 + 24 = 0$

$$\begin{aligned} & \frac{-45 \quad -45}{5x^2 = -45} \\ & \frac{5x^2}{5} = \frac{-45}{5} \\ & \sqrt{x^2} = \pm\sqrt{-9} \\ & x = \pm 3i \end{aligned}$$

$x = 3i$
or
 $x = -3i$

① isolate the x^2

② square root both sides
(don't forget \pm)

7. $\frac{-9x^2}{-9} = \frac{9}{-9}$

8. $7x^2 + 84 = 0$

$$\begin{aligned} & \sqrt{x^2} = \pm\sqrt{-1} \\ & x = \pm i \end{aligned}$$

③ simplify

9. $(-4+2i) + (6-3i)$
 $\boxed{2-i}$

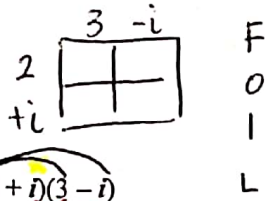
10. $(5-i) - (3-2i)$
 $\boxed{2+i}$

11. $(6-3i) + (4-2i)$
 $\boxed{10-5i}$

12. $(-11+4i) - (1-5i)$
 $\boxed{-12+9i}$

13. $(8+4i) + (8+4i)$
 $\boxed{16}$

14. $(5+2i) - (-6-3i)$
 $5+2i+6+3i$
 $\boxed{11+5i}$



15. $(2+i)(3-i)$

$$6 - 2i + 3i - i^2$$

$$6 - 2i + 3i - (-1)$$

$$(6 - 2i + 3i + 1)$$

$$7 + i$$

18. $\frac{5}{3+i} \cdot \frac{(3-i)}{(3-i)}$

$$\frac{5(3-i)}{(3+i)(3-i)} = \frac{15-5i}{10}$$

$$\frac{15-5i}{10} = \frac{3}{2} - \frac{1}{2}i$$

$$9 - 3i + 3i - i^2$$

$$9 - (-1)$$

$$\frac{10}{10}$$

16. $(5-2i)(4-i)$

$$20 - 5i - 8i + 2i^2$$

$$20 - 5i - 8i + 2(-1)$$

$$(20 - 5i - 8i - 2)$$

$$18 - 13i$$

19. $\frac{7-13i}{2i} \cdot \frac{-2i}{-2i}$

$$\frac{(7-13i)(-2i)}{2i(-2i)} = \frac{-14i + 26i^2}{-4i^2}$$

$$= \frac{-14i + 26(-1)}{-4(-1)} = \frac{-14i - 26}{4} = -\frac{14i}{4} - \frac{26}{4}$$

$$= -\frac{7i}{2} - \frac{13}{2}$$

17. $(4-2i)(1-2i)$

$$4 - 8i - 2i + 4i^2$$

$$4 - 8i - 2i + 4(-1)$$

$$4 - 8i - 2i - 4$$

$$-10i$$

20. $\frac{6-5i}{3i}$

Concept 10: Adding, Subtracting, and Multiplying Complex Numbers.

Simplify.

5) $6 + 3i - (-3 - 2i)$

6) $5 - 8i - 1 + i$

7) $5 + 7i + 2 + 4i$

8) $-2 + 2i - 5 + 5i$

9) $(-8 + 7i)(1 + 8i)$

10) $(-2 + 3i)(-3 - 6i)$

11) $(-5 - 6i)(6 - 4i)$

12) $(7i)(-4i)(3 + 6i)$

Concept 11: Rationalizing Denominators with Complex Numbers.

Simplify.

13) $\frac{7}{8i}$

14) $-\frac{8}{3i}$

15) $\frac{-3-4i}{-6i}$

16) $\frac{-8-5i}{-4i}$

17) $\frac{8}{-9+5i}$

18) $\frac{7i}{6+9i}$

19) $\frac{4-8i}{-1-4i}$

20) $\frac{-3-6i}{-9+3i}$

More

Practice!!!