Name: _____ Date: _____

Fresh Math

Polynomial Identities with Complex Numbers - Medium

Factor each expression over the complex numbers. Use $x^2 + b^2 = (x + bi)(x - bi)$.

1. $x^2 + 9$
2. $x^2 + 49$
3. $x^2 + 100$
4. $x^2 + 25$
5. $x^2 + 121$
6. $x^2 + 81$

Multiply and simplify. Use $i^2 = -1$.

7. $(x - (-2 + i))(x - (-2 - i))$
8. $(x + 5i)(x - 5i)$
9. $(x + 6i)(x - 6i)$
10. $(x + 2i)(x - 2i)$

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Polynomial Identities with Complex Numbers - Medium

Multiply and simplify. Use $i^2 = -1$.

11. $(x - (-6 + 2i))(x - (-6 - 2i))$

12. $(x + 3i)(x - 3i)$

Write a quadratic in standard form with the given roots.

13. $4 \pm i$

14. $5 \pm 5i$

15. $-6 \pm 6i$

16. $-2 \pm 5i$

17. $1 \pm i$

18. $4 \pm 4i$

19. $4 \pm 3i$

20. $-4 \pm 3i$

Polynomial Identities with Complex Numbers - Medium - Answer Key

1. $x^2 + 9$
   $(x + 3i)(x - 3i)$

2. $x^2 + 49$
   $(x + 7i)(x - 7i)$

3. $x^2 + 100$
   $(x + 10i)(x - 10i)$

4. $x^2 + 25$
   $(x + 5i)(x - 5i)$

5. $x^2 + 121$
   $(x + 11i)(x - 11i)$

6. $x^2 + 81$
   $(x + 9i)(x - 9i)$

7. $(x - (-2 + i))(x - (-2 - i))$
   $x^2 + 4x + 5$

8. $(x + 5i)(x - 5i)$
   $x^2 + 25$

9. $(x + 6i)(x - 6i)$
   $x^2 + 36$

10. $(x + 2i)(x - 2i)$
    $x^2 + 4$

Polynomial Identities with Complex Numbers - Medium - Answer Key

11. $(x - (-6 + 2i))(x - (-6 - 2i))$

$x^2 + 12x + 40$

12. $(x + 3i)(x - 3i)$

$x^2 + 9$

13. $4 \pm i$

$x^2 - 8x + 17$

14. $5 \pm 5i$

$x^2 - 10x + 50$

15. $-6 \pm 6i$

$x^2 + 12x + 72$

16. $-2 \pm 5i$

$x^2 + 4x + 29$

17. $1 \pm i$

$x^2 - 2x + 2$

18. $4 \pm 4i$

$x^2 - 8x + 32$

19. $4 \pm 3i$

$x^2 - 8x + 25$

20. $-4 \pm 3i$

$x^2 + 8x + 25$