PreCalc 4.5-4.6 Partner Test

Names Key

Simplify. Write any complex number solutions in **standard form**.

1. $(-3+7i)-(9+12i)$

+1 Standard form

1. $-12-5i$ 2

2. $(-3-2i)(5-3i)$

$-15+9i-10i+6i^2$

2. $-21-i$ 2

3. $(8-\sqrt{-27})+(9+\sqrt{-48})$

$(8-3i\sqrt{3})+(9+4i\sqrt{3})$

6 8

2 3 2 2 2

3. $17+i\sqrt{3}$ 2

4. $\sqrt{-32}(\sqrt{6}-\sqrt{-3})$

$4i\sqrt{2}(\sqrt{6}-\sqrt{3}i)$

2 2 2 2 2

$8i\sqrt{3}-4i^2\sqrt{6}$

4. $4\sqrt{6}+8i\sqrt{3}$ 2

5. $\sqrt{-49}+\sqrt{12}$

$7i+2\sqrt{3}$

5. $2\sqrt{3}+7i$ 2

6. $-5i(7-3i)$

$-35i+15i^2$

6. $-15-35i$ 2

7. $\dfrac{-\sqrt{-64}}{\sqrt{-4}} = \dfrac{-8i}{2i}$

7. -4 2

8. $\dfrac{(5+2i)(3-4i)}{(3+4i)(3-4i)} = \dfrac{15-20i+6i-8i^2}{9-16i^2}$

15 +8

8. $\dfrac{23-14i}{25}$ 3

$\dfrac{(7+8i)(1-8i)}{(1+8i)(1-8i)} = \dfrac{7-56i+8i+64}{1+64}$ unrationalized

9. $\dfrac{1}{2+i}+\dfrac{3+i}{2+3i}$

$\dfrac{1(2+3i)}{(2+i)(2+3i)} + \dfrac{(3+i)(2+i)}{(2+i)(2+3i)} = \dfrac{2+3i+6+5i+i^2}{4+8i+3i^2} = \dfrac{7+8i}{1+8i}$

9. $\left[\dfrac{7+8i}{1+8i}\right]$ $\dfrac{71-48i}{65}$ 4

10. i^{33}

$(i^2)^{16} i$

$(-1)^{16}$

10. i 2

11. Find x and y: $7x-5yi=-28+25i$

11. $x=-4$ 2

$y=-5$

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For #12-14, solve the equations, finding all real and imaginary solutions. Be sure to simplify all answers.

12. $5x^2+1=-2x$

$5x^2+2x+1=0$

$\frac{-2\pm\sqrt{4-4(5)(1)}}{10}$

$\frac{-2\pm\sqrt{-16}}{10} = \frac{-2\pm 4i}{10}$

12. $\frac{-1\pm 2i}{5}$ +3

13. $x^4-81=0$

$(x^2-9)(x^2+9)$

13. $\pm 3, \pm 3i$ x4

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14. $3x^4+81x=0$

$3x(x^3+27)$

$3x(x+3)(x^2-3x+9)$

$\frac{3\pm\sqrt{9-4(1)(9)}}{2}$

$\frac{3\pm\sqrt{-27}}{2}$

14. $0, -3, \frac{3\pm 3i\sqrt{3}}{2}$ 4

For #15-18, find a polynomial with real coefficients that satisfy the given conditions. Leave your answer in factored form without any imaginary numbers.

15. degree 5: zeros include 4 (multiplicity 3), and $3-4i$

$(x-4)^3(x-(3-4i))(x-(3+4i))$

$(x-3)^2+16$ $x^2-6x+9+16$

15. $(x-4)^3(x^2-6x+25)$ 5

16. degree 2: zeros include $1-2i$; $f(2)=4$

$(x-(1-2i))(x-(1+2i))$

$(x-1)^2+4$

$x^2-2x+1+4$

$y=a(x^2-2x+5)$

$4=a(5)$

16. $\frac{4}{5}(x^2-2x+5)$ 4

17. Find **all** the zeros of the polynomial

$g(x)=x^4-2x^3+5x^2-8x+4$, given 1 is a zero of multiplicity of 2.

1	1	-2	5	-8	4
		1	-1	4	-4
	1	-1	4	-4	0

1	1	-1	4	-4
		1	0	-4
	1	0	4	0

$x^2+4=0$

17. $1, \pm 2i$ 3

18. Find **all** the zeros of the polynomial

$g(x)=2x^4-x^3+7x^2-4x-4$, given that $2i$ is a zero.

$(x-2i)(x+2i)$

x^2+4

$2x^2-x-1$

$x^2+4 \overline{)2x^4-x^3+7x^2-4x-4}$

$2x^4+8x^2$

$-x^3-x^2-4x$

$-x^3-4x$

$-x^2-4$

$(2x^2-x-1)$

$(2x+1)(x-1)$

18. $\pm 2i, -\frac{1}{2}, 1$ 4

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2. $(-3-2i)(5-3i)$ 2. _____

3. $(8-\sqrt{-27})+(9+\sqrt{-48})$ 3. _____

4. $\sqrt{-32}(\sqrt{6}-\sqrt{-3})$ 4. _____

5. $\sqrt{-49}+\sqrt{12}$ 5. _____

6. $-5i(7-3i)$ 6. _____

7. $\dfrac{-\sqrt{-64}}{\sqrt{-4}}$ 7. _____

8. $\dfrac{5+2i}{3+4i}$ 8. _____

9. $\dfrac{1}{2+i}+\dfrac{3+i}{2+3i}$ 9. _____

10. i^{33} 10. _____

11. Find x and y: $7x-5yi=-28+25i$ 11. _____

For #12-14, solve the equations, finding all real and imaginary solutions. Be sure to simplify all answers.

12. $5x^2+1=-2x$ 12._____

13. $x^4-81=0$ 13._____

14. $3x^4+81x=0$ 14._____

For #15-18, find a polynomial with real coefficients that satisfy the given conditions.
Leave your answer in factored form without any imaginary numbers.

15. degree 5: zeros include 4 (multiplicity 3), and $3-4i$ 15._____

16. degree 2: zeros include $1-2i$; $f(2)=4$ 16._____

17. Find **all** the zeros of the polynomial 17._____
$g(x)=x^4-2x^3+5x^2-8x+4$, given 1 is a zero of multiplicity of 2 .

18. Find **all** the zeros of the polynomial 18._____
$g(x)=2x^4-x^3+7x^2-4x-4$, given that $2i$ is a zero.