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Algebra II

Operations with Complex Numbers

Multiply the following pairs of complex numbers and express in a + b*i* form

1. $(5 - 2i) \bullet (2 - 3i)$

	5	$-2i$
2	10	$-4i$
$-3i$	-15	$+6i^2$

$6i^2 - 19i + 10$

$6(-1) - 19i + 10$

$-6 - 19i + 10$

$4 - 19i$

2. $(-2 + 2i) \bullet (8 - i)$

	-2	$+2i$
8	-16	$+16i$
$-i$	$+2i$	$-2i^2$

$-2i^2 + 18i - 16$

$-2(-1) + 18i - 16$

$2 + 18i - 16$

$-14 + 18i$

3. $(7 - 2i) \bullet (8 + 3i)$

	7	$-2i$
8	56	$-16i$
$3i$	$21i$	$-6i^2$

$-6i^2 + 5i + 56$

$-6(-1) + 5i + 56$

$6 + 5i + 56$

$62 + 5i$

4. $(6 - i) \bullet (8 - 5i)$

	6	$-i$
8	48	$-8i$
$-5i$	$-30i$	$+5i^2$

$5i^2 - 38i + 48$

$5(-1) - 38i + 48$

$-5 - 38i + 48$

$43 - 38i$

5. $(-2 + 9i) \bullet (6 + 8i)$

	-2	$+9i$
6	-12	$+54i$
$+8i$	$-16i$	$72i^2$

$72i^2 + 38i - 12$

$72(-1) + 38i - 12$

$-72 + 38i - 12$

$-84 + 38i$

6. $(-7 + 2i) \bullet (7 + 6i)$

	-7	$+2i$
7	-49	$14i$
$+6i$	$-42i$	$12i^2$

$12i^2 - 28i - 49$

$12(-1) - 28i - 49$

$-12 - 28i - 49$

$-61 - 28i$

7. Write $(5 + 2yi)(4 - 3i) - (5 - 2yi)(4 - 3i)$ in $a + bi$ form, where y is a real number.

	5	$2yi$
4	20	$8yi$
$-3i$	$-15i$	$-6yi^2$

$-6yi^2 - 15i + 8yi + 20$

$-6y(-1) - 15i + 8yi + 20$

$6y - 15i + 8yi + 20$

	5	$-2yi$
4	20	$-8yi$
$-3i$	$-15i$	$+6yi^2$

$6yi^2 - 15i - 8yi + 20$

$6y(-1) - 15i - 8yi + 20$

$-6y - 15i - 8yi + 20$

$6y - 15i + 8yi + 20$

$+ \; 6y + 15i + 8yi + 20$

$12y + 16yi$

12cc

$(a+b)^2 = a^2+2ab+b^2$

8. Given i is the imaginary unit, $(2-yi)^2$ in simplest form is

1) $y^2-4yi+4$
2) $-y^2-4yi+4$
3) $-y^2+4$
4) y^2+4

$4-4yi+y^2i^2$

$4-4yi+y^2(-1)$

$-y^2-4yi+4$

9. The expression $(3-7i)^2$ is equivalent to

1) $-40+0i$
2) $-40-42i$
3) $58+0i$
4) $58-42i$

$9-42i+49i^2$

$9-42i+49(-1)$

$9-42i-49$

$-40-42i$

10. The expression $(x+i)^2-(x-i)^2$ is equivalent to

1) 0
2) -2
3) $-2+4xi$
4) $4xi$

$(x^2+2xi+i^2)-(x^2-2xi+i^2)$ $+\ x^2+2xi+i^2$ $-(x^2+2xi+i^2)$

$4xi$

11. If x is a real number, express $2xi(i-4i^2)$ in simplest $a+bi$ form.

$2xi^2-8xi(i^2)$

$2x(-1)-8xi(-1)$

$-2x+8xi$

12. Simplify $xi(i-7i)^2$, where i is the imaginary unit.

$xi(-6i)^2$

$xi(36i^2)$

$xi(36(-1))$

$-36xi$