

1. Efectúa las siguientes operaciones y simplifica el resultado:

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

b) $(2 - 3i) - (5 + 4i) + (1/2)(6 - 4i)$

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

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

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

f) $2 + 4i$

g) $4 - 2i$

h) $1 - 4i$

i) $3 + i$

j) $4 + 4i$

k) $-3 + 5i$

l) $5 + i$

m) $-2 - i$

n) $1 + 5i$

o) $3 + 4i$

p) $4 - 2i$

q) i

r) $6 - 3\left(5 + \frac{2}{5}i\right)$

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

t) $-2 + 3i$

u) $(-3i)^2(1 - 2i)$

v) $2 + 2i$

$$a) (6 - 5i) + (2 - i) - 2(-5 + 6i) = 6 - 5i + 2 - i + 10 - 12i = \mathbf{18 - 18i}$$

$$b) (2 - 3i) - (5 + 4i) + (1/2)(6 - 4i) = 2 - 3i - 5 - 4i + 3 - 2i = \mathbf{-9i}$$

$$c) (3 + 2i)(4 - 2i) = 12 - 6i + 8i - 4i^2 = 12 + 2i + 4 = \mathbf{16 + 2i}$$

$$d) (2 + 3i)(5 - 6i) = 10 - 12i + 15i - 18i^2 = 10 + 3i + 18 = \mathbf{28 + 3i}$$

$$e) (-i + 1)(3 - 2i)(1 + 3i) = (-3i + 2i^2 + 3 - 2i)(1 + 3i) = (3 - 2 - 5i)(1 + 3i) = (1 - 5i)(1 + 3i) = 1 + 3i - 5i - 15i^2 = 1 + 15 - 2i = \mathbf{16 - 2i}$$

$$f) \frac{2+4i}{4-2i} = \frac{(2+4i)(4+2i)}{(4-2i)(4+2i)} = \frac{8+4i+16i+8i^2}{4^2-(2i)^2} = \frac{8+20i+8(-1)}{16-4(-1)} = \frac{8+20i-8}{16+4} = \frac{20i}{20} = \mathbf{i}$$

$$g) \frac{1-4i}{3+i} = \frac{(1-4i)(3-i)}{(3+i)(3-i)} = \frac{3-i-12i+4i^2}{3^2-i^2} = \frac{3-13i+4(-1)}{9-(-1)} = \frac{3-13i-4}{9+1} = \frac{-1-13i}{10} = \mathbf{(-1/10)-(13/10)i}$$

$$h) \frac{4+4i}{-3+5i} = \frac{(4+4i)(-3-5i)}{(-3+5i)(-3-5i)} = \frac{-12-20i-12i-20i^2}{(-3)^2-(5i)^2} = \frac{-12-32i-20(-1)}{9-25(-1)} = \frac{8-32i}{34} = \frac{4}{17} - \frac{16}{17}i$$

$$i) \frac{5+i}{-2-i} = \frac{(5+i)(-2+i)}{(-2-i)(-2+i)} = \frac{-10+5i-2i+i^2}{(-2)^2-i^2} = \frac{-10+3i-1}{4-(-1)} = \frac{-11+3i}{5} = \mathbf{-\frac{11}{5} + \frac{3}{5}i}$$

$$j) \frac{1+5i}{3+4i} = \frac{(1+5i)(3-4i)}{(3+4i)(3-4i)} = \frac{3-4i+15i-20i^2}{3^2-(4i)^2} = \frac{3+11i-20(-1)}{9-16(-1)} = \frac{3+11i+20}{9+16} = \frac{23}{25} + \frac{11}{25}i$$

$$k) \frac{4-2i}{i} = \frac{(4-2i)i}{i^2} = \frac{4i-2i^2}{-1} = \mathbf{-2-4i}$$

$$l) 6-3\left(5+\frac{2}{5}i\right) = 6-15-\frac{6}{5}i = \mathbf{-9-\frac{6}{5}i}$$

$$m) \frac{3i(-4i+2)}{-2+3i} = \frac{(-12i^2+6i)(-2-3i)}{(-2+3i)(-2-3i)} = \frac{-24-36i-12i-18i^2}{(-2)^2-(3i)^2} = \frac{-24-48i-18(-1)}{4-9(-1)} = \frac{-6-48i}{13} = \mathbf{-\frac{6}{13} - \frac{48}{13}i}$$

$$n) \frac{(-3i)^2(1-2i)}{2+2i} = \frac{-9(1-2i)(2-2i)}{(2+2i)(2-2i)} = \frac{(-9+18i)(2-2i)}{2^2-(2i)^2} = \frac{-18+18i+36i+36}{4-4(-1)} = \frac{18+54i}{16} = \mathbf{\frac{9}{8} + \frac{27}{8}i}$$