

Name: _____

Operations with Complex Numbers

1) Simplify and write the answer in the form of $x + iy$:

1) $\frac{1+i}{3+i}$

2) $\frac{1}{1+i} + \frac{1}{1-i}$

3) $\left(\frac{\sqrt{3}-i}{1+i\sqrt{3}}\right)^9$

4) $1+i+i^2+i^3+i^4$

5) $2+4i+(1-i)(2+i)+\frac{1}{3-i}$

6) $(1+i\sqrt{3})^3$

7) $\frac{1-\sqrt{-5}}{3+\sqrt{-4}}$

8) $\frac{2}{9+i\sqrt{-2}}$

9) $\frac{25}{1+2\sqrt{-3}}$

10) $\frac{5-i}{2+3i}$

11) $\frac{1-\sqrt{-9}}{3+\sqrt{-4}}$

12) $\frac{7-3i}{1+2i} \cdot \frac{1-i}{4-3i}$

13) $\frac{4-i}{3+4i} + \frac{3+2i}{3-4i}$

14) $\frac{2+i}{1-i} + \frac{3i-1}{i+1}$

2) Add $(4+5i)+(7+3i)$

3) Multiply $(4+5i)(7+3i)$

4) Divide $\frac{4+5i}{7+3i}$

5) Given that $(x+6)+(3y-7)i=2+8i$. Find x and y

6) Perform:

1) $(3 - 9i) + (6 + 5i) - (7 - 2i)$

2) $(3-i)^3$

3) $\sqrt{-32} + i\sqrt{-18} - 3\sqrt{-2}$

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

7) Expand: $(3 - i)^6$

8) Show that $\frac{\sqrt{3}}{2} - \frac{1}{2}i$ is the cube root of $(-i)$.

9) Find x and y if: $(x + iy)(5 + 2i) = 2 + 3i$