Section 1.1

1.) **Problem:** Evaluate the following:

$$(1+2i)^3, \quad \frac{5}{-3+4i}, \quad \left(\frac{2+i}{3-2i}\right)^2, \quad (1+i)^n + (1-i)^n$$

Solutions:

a.) $(1+2i)^3 = (-3+4i)(1+2i) = -11-2i$

b.) We have that

$$\frac{5}{-3+4i} = \frac{5}{-3+4i} \cdot \frac{-3-4i}{-3-4i} = \frac{-15-20i}{25} = -\frac{3}{5} - \frac{4}{5}i$$

c.) We have that

$$\left(\frac{2+i}{3-2i}\right)^2 = \frac{2+i}{3-2i} \cdot \frac{2+i}{3-2i} = \frac{3+4i}{5-12i} = \frac{3+4i}{5-12i} \cdot \frac{5+12i}{5+12i} = \frac{-33+56i}{169}$$

$$= -\frac{33}{169} + \frac{56}{169}i$$

d.) Awd