

1. Express in terms of  $i$  and simplify.

$$\sqrt{-28} = i\sqrt{28} = i\sqrt{4 \cdot 7} = \boxed{2i\sqrt{7}}$$

2. Simplify and write the result in the form  $a + bi$ .

$$\text{a) } (8 - 5i) - (6 + 2i) = \cancel{8} - 5i - \cancel{6} - 2i = \boxed{2 - 7i}$$

$$\text{b) } -6i(3 - 5i) = -18i + 30i^2 = -18i + 30(-1) = \boxed{-30 - 18i}$$

$$\begin{aligned} \text{c) } (7 - 2i)(-3 + 6i) &= 21 + 42i + 6i - 12i^2 \\ &= -21 + 48i + 12 \end{aligned} \quad \left. \begin{array}{l} -12i^2 = -12(-1) = 12 \end{array} \right\}$$

$$= \boxed{-9 + 48i}$$

$$\text{d) } \sqrt{-16} \cdot \sqrt{-8} = i\sqrt{16} \cdot i\sqrt{8} = i^2 \cdot 4 \cdot \sqrt{8} = (-1) \cdot 4 \cdot 2\sqrt{2} = \boxed{-8\sqrt{2}}$$

$$\text{e) } \frac{1-i}{1+i} = \frac{1-i}{1+i} \cdot \frac{1-i}{1-i} = \frac{1-2i+i^2}{1-i^2} = \frac{\cancel{1} - 2i + \cancel{(-1)}}{1-(-1)} = \frac{-2i}{2} = \boxed{-i}$$

$$\begin{aligned} \text{f) } \frac{3+4i}{5i} &= \frac{3+4i}{5i} \cdot \frac{-5i}{-5i} = \frac{-15i - 20i^2}{-25i^2} = \frac{-15i - 20(-1)}{-25(-1)} = \frac{20 - 15i}{25} \\ &= \frac{20}{25} - \frac{15}{25}i \\ &= \boxed{\frac{4}{5} - \frac{3}{5}i} \end{aligned}$$

$$\text{g) } i^{46} = (i^2)^{23} = (-1)^{23} = \boxed{-1}$$

$$\text{h) } i^{15} = i^{14} \cdot i = (i^2)^7 \cdot i = (-1)^7 \cdot i = (-1) \cdot i = \boxed{-i}$$

Q: A man while looking at a photograph said, "Brothers and sisters have I none. That man's father is my father's son." Who was the person in the photograph?