How do we evaluate imaginary numbers?

Do Now Find x.

1) $x^2 = 4$

$x = \pm 2$

2) $x^2 = -4$ ← imaginary

$\sqrt{-4} = \sqrt{4}\sqrt{-1}$

$= 2i$

$\sqrt{-9} = \sqrt{9}\sqrt{-1} = 3i$

1) $\sqrt{-16}$

$= \sqrt{-1}\sqrt{16} = 4i$

2) $\sqrt{-50}$

$= \sqrt{25}\sqrt{-1}\sqrt{2}$

$= 5i\sqrt{2}$

3) $3\sqrt{-12}$

$= 3\sqrt{4}\sqrt{3}\sqrt{-1}$

$= 3 \cdot 2 \cdot \sqrt{3} \cdot i = 6i\sqrt{3}$

4) $\sqrt{-3}\sqrt{-3}$

$= 3$

$-3 \cdot -3$

$= 9$

$= 3$

A

A' $\sqrt{3}\sqrt{3}\sqrt{-1}\sqrt{-1}$

$= 3ii$

$= 3(i^2)$

$= 3(-1) = -3$

$\sqrt{a}\sqrt{a} = a$

$\sqrt{-3}\sqrt{-3} = -3$

Multiply

5) $(2i)(3i) =$

$(2)(3)(i)(i) = \boxed{-6}$

6) $(5+i)(2-i) = 10 - 5i + 2i - i^2$

$= 10 - 3i + (+1) = 11 - 3i$

7) $(2+3i)^2$

$= (2+3i)(2+3i)$

$= 4 + 6i + 6i + 9i^2 = 4 + 12i + 9(-1)$

$= -5 + 12i$

8) $3i(4-2i)$

$= 12i - 6i^2 = 12i + 6(+1) = 6 + 12i$

9) $(2i)^3 = 2^3 \cdot i^3$

$= 8 \cdot i^2 \cdot i = 8(-1)i = -8i$