

Unit 2 Day 11 – Radicals and Complex Numbers – HOMEWORK

REMEMBER: $i^0 = \underline{\quad}$ $i = \underline{\quad}$ $i^2 = \underline{\quad}$ $i^3 = \underline{\quad}$ So all powers of i simplify to $1, i, -1, -i,$

Find the simplest form of the given power of i :

1) $i^{23} =$

2) $i^{13} =$

3) $i^{42} =$

4) $i^{29} =$

5) $i^7 =$

6) $i^{37} =$

Simplify:

$\sqrt{-4} = \underline{\quad}$

$-\sqrt{-25} = \underline{\quad}$

$\sqrt{-169} = \underline{\quad}$

$-\sqrt{-121} = \underline{\quad}$

$\sqrt{-36} = \underline{\quad}$

Add or Subtract the following imaginary numbers: (Write your answer in $a + bi$ form)

7. $(2 + 3i) + (-6 - 4i) = \underline{\quad}$

8. $(23 + 4i) - (-12 + i) = \underline{\quad}$

9. $(-4 - 2i) + (28 - 13i) = \underline{\quad}$

10. $(17 + 4i) - (-19 - 8i) = \underline{\quad}$

Multiply the following imaginary numbers (Write your answer in $a + bi$ form)

11. $3i(2 - 6i) =$

12. $(2 + 4i)(-3 - 2i) =$

13. $(-12 + i)(9 - 4i) =$

14. $(13 - i)(13 + i) =$

Find the value of the following variables: (Hint: y is **only** the coefficient of i .)

15. $(3 - 2i) - (x + yi) = (2 - 3i)$

16. $(2 + 4i) + (x + yi) = (7 - 5i)$

$x = \underline{\quad}$ $y = \underline{\quad}$

$x = \underline{\quad}$ $y = \underline{\quad}$

17. $(8 - 2i) - (x + yi) = (2 - 5i)$

18. $(4 + 2i) + (x + yi) = (5 - 7i)$

$x = \underline{\quad}$ $y = \underline{\quad}$

$x = \underline{\quad}$ $y = \underline{\quad}$

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USE () for division of complex numbers! **Give your answer as a complex number $a + bi$.**
SHOW ALL YOUR WORK for the ODD problems. ☺ Check with your calculator.

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

2) $\frac{4}{6+2i}$

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

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

5) $\frac{2i}{9-12i}$

6) $\frac{-4}{i}$

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

8) $\frac{6+2i}{6+2i}$

9) $\frac{13i}{4-2i}$

10) $\frac{4}{2-i}$

11) $\frac{12i}{4}$

12) $\frac{7-3i}{5+2i}$

Simplifying Radicals - show your prime factors.

$\sqrt{24} = \underline{\hspace{2cm}}$	$\sqrt{50} = \underline{\hspace{2cm}}$	$\sqrt{168} = \underline{\hspace{2cm}}$
$\sqrt{120} = \underline{\hspace{2cm}}$	$\sqrt{46} = \underline{\hspace{2cm}}$	$\sqrt{124} = \underline{\hspace{2cm}}$
$\sqrt{78} = \underline{\hspace{2cm}}$	$\sqrt{52} = \underline{\hspace{2cm}}$	$\sqrt{146} = \underline{\hspace{2cm}}$

All done!