6.1 Imaginary & Complex Numbers

NOTES

Write your questions here!

Imaginary Numbers

$\sqrt{36}$ $\sqrt{-25}$ $\sqrt{-50}$

$i =$
$i^2 =$
$i^3 =$
$i^4 =$

$i^5 =$
$i^6 =$
$i^{15} =$
$i^{34} =$

Solve

$18 = -2n^2$ | $x^2 + 1 = -6$ | $3y^2 - 2 =$

Complex Numbers

$a + bi$

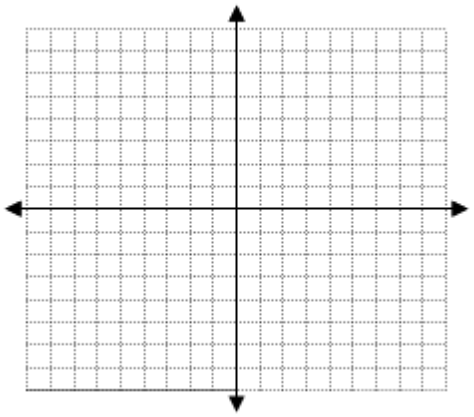
Graph Complex Numbers

a. $4 + 5i$

b. $-2 - 3i$

c. $3i$

d.



Solve

$-25 = (n-1)^2$

$(x+3)^2 + 8 = 6$

$\frac{1}{3}(y+2)^2 + 7 =$

SUMMARY:

Now, summarize your notes here!

6.1 Imaginary & Complex Numbers

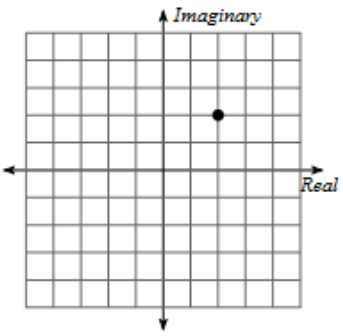
PRACTICE

Simplify.

1. i^9	2. i^{25}	3. i^{19}	4. i^{42}	5. i^{80}
6. $\sqrt{45}$	7. $\sqrt{-20}$	8. $\sqrt{-75}$	9. $-\sqrt{27}$	10. $\sqrt{-64}$

Identify each complex number graphed.

11.



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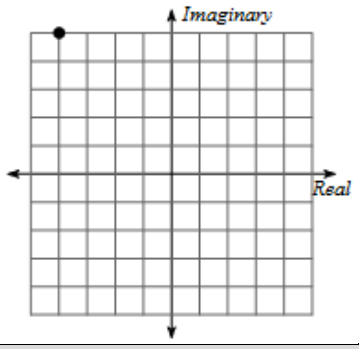

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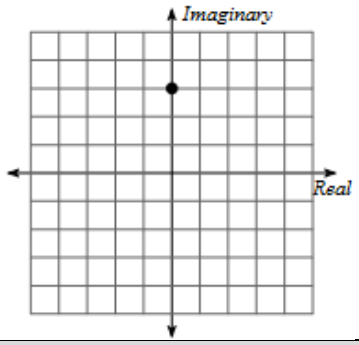

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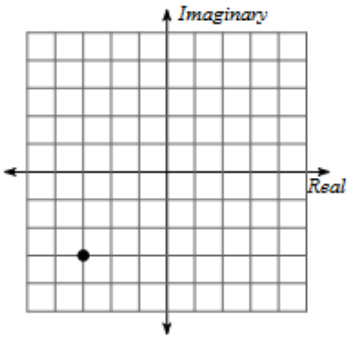
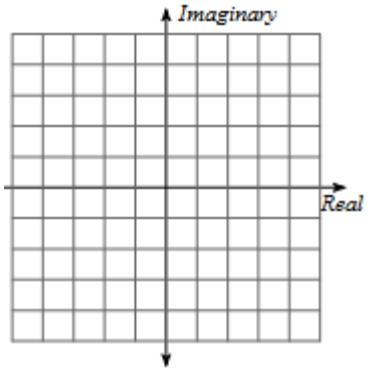
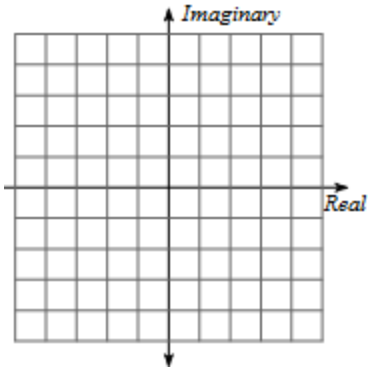


Graph each number in the complex plane.

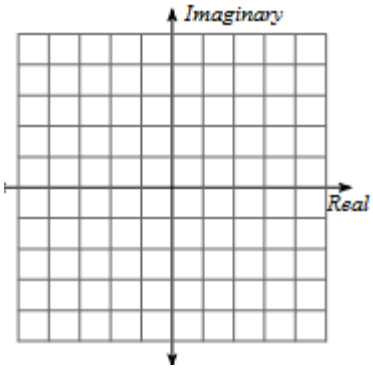
15. $3 - 4i$



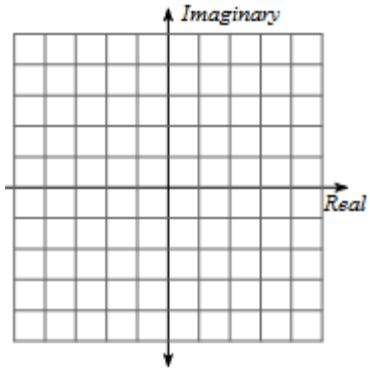
16. $-5 - i$



17. -2



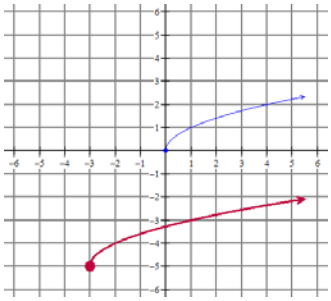
18. $-3 - 2i$



Solve. Express your radical solutions in the simplest form.

19. $x^2 + 2 = -26$	20. $9 - 4y^2 = 57$	21. $2m^2 = -200$

Solve. Express your radical solutions in the simplest form.		
22. $(x-3)^2+28=4$	23. $-60=2(h+7)^2+4$	24. $3(t-6)^2=-75$
25. $p^2+70=-2p^2+4$	26. $(v-3)^2+5=0$	27. $w^2+58=4$

Algebra Skillz		
GRAPH	**SIMPLIFY**	**SOLVE**
Below, the graph of $f(x)=\sqrt{x+3}-5$ is sketched in bold. Its parent function $f(x)=\sqrt{x}$ is represented by the thin curve. 1. Describe the translation of the parent graph.  2. How does the translation relate to the equation?	3. $\sqrt{20}+4\sqrt{5}$ 4. $-4(5+\sqrt{7})$	5. Solve: $(2x+1)(3x-7)=0$ 6. Factor and solve. $x^2-3x-88=0$

APPLICATION

Simplify.	**Solve. Express your radical solutions in the simplest form.**
1. $\sqrt{-32}$	2. $5 - 2(x-6)^2 = 103$

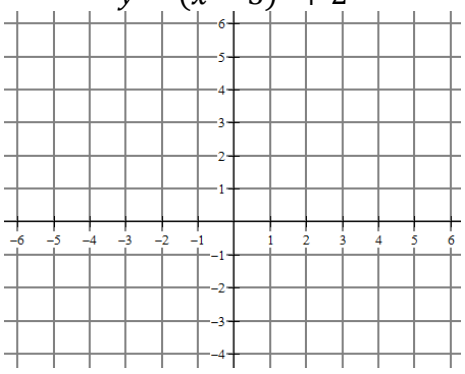
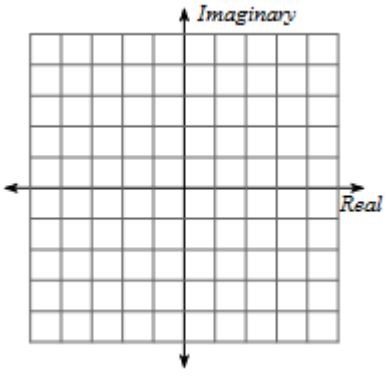
3. Circle all values of *x* that are true if $x^4 = 16$. (There can be more than one answer!!!)

A. $x = \pm 4$ B. $x = \pm 2$ C. $x = 2i$ D. $x = -2i$ E. $x = 4i$ F. $x = -4i$

4. Circle all values of *x* that are true if $x^3 = 27i$. (There can be more than one answer!!!)

A. $x = 3$ B. $x = 3i$ C. $x = -3i$ D. $x = -3$ E. $x = 3i\sqrt{3}$ F. $x = -3i\sqrt{3}$

5. Graph the quadratic equation, solve it algebraically, then graph its non-real solutions.

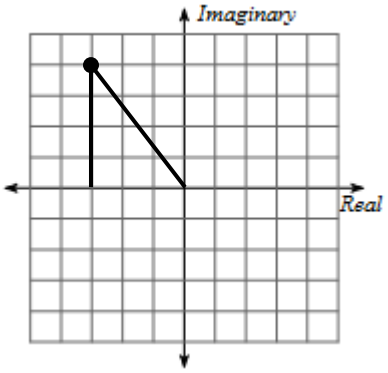
GRAPH	SOLVE	GRAPH THE SOLUTIONS
$y = (x-3)^2 + 2$ 	$0 = (x-3)^2 + 2$	

6. The absolute value of complex number is found by using the following formula: $|a + bi| = \sqrt{a^2 + b^2}$
Find the absolute value of the following :

A. $-4 + 3i$

B. $-5 - 7i$

7. **GRAPHICALLY** The absolute value of complex number is the distance from the origin to the complex point in the complex plane. The point $-3 + 4i$ has been graphed below. Use Pythagorean Theorem to determine the absolute value of this point.



8. **SAT PREP** Imaginary numbers are NOT on the SAT. For this Unit we will look at "Mr.Kelly Problems". They are called Kelly Problems because they look weird and are confusing. Don't freak out about these, once you get the hang of them they are pretty easy.

MULITPLE CHOICE

If $*\ g\ * = g + g^2$, then find $*\ 3\ *$.

(A) 6
(B) 9
(C) 12
(D) 15
(E) 18

GRID IN

$x \otimes y = x - 2y$. If $4 \otimes 5 = k \otimes 10$, find the value of k.