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|  Where have we seen imaginary numbers before? |

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| Imaginary Numbers |

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| Simplifying Powersof i’s |

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| The Patterns of Powers, Signs, 1’s, and i’s |

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| Imaginary NumbersUntil now you have been told you cannot take the square root of a negative number. Now, however, you can take the square root of a negative number, but it involves a new number called “i” which is called the imaginary number.$$i=\sqrt{-1}$$Simplify:Ex. $\sqrt{-25}$ Ex. $\sqrt{-9}$ Ex. $\sqrt{-40}$ Ex. $\sqrt{-70}$  | Where have we seen imaginary numbers before?In Math 1, we learned the quadratic formula and the discriminant. The discriminant, b2 – 4ac, determines the number of solutions and the type of solutions we will have with a quadratic equation.Number and type of Real solutions to a Quadratic Function: **Two Real One Real No Real** b2 – 4ac > 0 b2 – 4ac = 0 b2 – 4ac < 0   |
| The Patterns of Powers, Signs, 1’s, and i’sLook for the patterns below:$i^{1}=$ $i^{5}=$$i^{2}=$ $i^{6}=$$i^{3}=$ $i^{7}=$$i^{4}=$ $i^{8}=$What patterns do you see? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Simplifying Powers of i’sTo simplify i to any power, try to get the exponent to an even power by removing an i if the exponent is odd, and then reverse the “power to a power” rule by dividing by two. Simplify using the properties of algebra.Ex. $i^{17}=$ Ex. $i^{98}=$Ex. $i^{39}=$ Ex. $i^{65}=$ |