**COMPLEX NUMBERS (SAMPLE RESPONSES)**

# Engage

## Not Like the Others

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| **1)*****Sample Responses***  *The sandwich is not like the others because it’s not round.*  *The button is not like the others because it’s not food.*  *The donut is not like the others because it’s sweet.* | **2)*****Sample Responses***  *The* −16 *is not like the others because there is a negative number inside the radical.*  *The* 75 *is not like the others because it’s much bigger than the other numbers.*  *The* 9 *is not like the others because it’s the only single-digit radicand.* |

# Explore

## Simplify and Justify

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| **3)** Simplify: 16=4  *because* (4)2 =16 | **4)** Try to simplify: −16≠±4  *because* (4)2 =16  (−4)2 =16 |
| **5)** Simplify: 20  = 4 5    = 2 5 | **6)** Try again to simplify: −16  = 16 1−    = 4 1− |

## I Notice, I Wonder

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| **I Notice…**  ***Sample Responses***  *I notice that the square root of a negative number can’t be simplified…*  *I notice* −16≠−4 *because* (−4)2 *is* +16*…* | **I Wonder…**  ***Sample Responses***  *I wonder if that is always true.*  *I wonder if something squared could equal a negative number.* |



**MY IMAGINARY FRIEND, PART 1**

# Explain

## Practice

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| **7)** −48 = 4 1 12−  = 2 4 3*i*  = 2 2 3*i*( )  = 4 3*i* | **8)** − −36 = −1 36 1⋅ −  = −1⋅6⋅*i*  = −6*i* |

# Extend

## Simplify and Justify

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| *i*1 = − =1 *i* | *i*5 = *i*4 ⋅ =*i* (1)(*i*) = *i* | *i*9 = (*i*4)2 ⋅ =*i* (1)2 (*i*) = *i* |
| 2 *i*2 = − =−( 1) 1 | *i*6 = *i*4 ⋅*i*2 = (1 1)(− ) = −1 | *i*10 = (*i*4)2 ⋅*i*2 = (1)2 (−1) = −1 |
| *i*3 = (*i*)2 ⋅*i* = (−1)(*i*) = −*i* | *i*7 = (*i*2)3 ⋅ = −*i* ( 1)3(*i*) = −*i* | *i*11 = (*i*2)5 ⋅ = −*i* ( 1)5(*i*) = −*i* |
| *i*4 = (*i*)2 ⋅(*i*)2 = −( 1 1 1)(− ) = | *i*8 = (*i*4)⋅(*i*4) = (*i*4)2 = (1)2 =1 | *i*12 = (*i*4)3 = (1)3 =1 |

## I Notice, I Wonder

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| --- | --- |
| **I Notice…**  ***Sample Responses***  *I notice the answer in each row is the same…*  *I notice that i to the power of 4 equals 1, which makes simplifying easier…* | **I Wonder…**  ***Sample Responses***  *I wonder if that is always true.*    *I wonder if there are other patterns.* |

## Practice

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| 25  **9)** *i*100 =(*i*4) =(1)25 =1 ***or*** *100 is a multiple of 4, so* *i*100 =1 |
| **10)** *i*45 = *i*44 ⋅ =*i* (*i*4)11(*i*) = (1)11(*i*) = *i* ***or***  *i*45 = *i*44 ⋅ =*i* (1)(*i*) = *i* |
| **11)** *i*67 = *i*64 ⋅*i*3 = (*i*4)16 (*i*2)(*i*) = (1)16 (−1)(*i*) = −*i* ***or*** *i*67 = *i*64 ⋅*i*3 = (1)(−*i*) = −*i* |



**MY IMAGINARY FRIEND, PART 1**