**Activity 1.6.1 Functions and their Inverses**

1. This question asks you to describe the meaning of the output of a function and its inverse function given a value of the input. For example: if h(x) is a function describing the height of a ball (in feet) *x* seconds after it was dropped from a building, then h-1 is a function describing the amount of time (in seconds) it takes for the ball to reach a height of x feet.

a. *h*(*t*) is a function describing the height of a ball (in feet) *t* seconds after it was dropped from a building. What does *h*(*3*) mean? What does *h*-1(*3*) mean?

b. *C*(*d*) is a function describing the cost *C* in hundreds of dollars of production of widgets after *d* days. What does *C*(*10*) mean? What does *C*-1(*10*) mean?

c. *p*(*t*) is a function describing the perimeter *p* of a square (in cm) with a side of length *t* centimeters . What does *p*(*5*) mean? What does *p*-1(*5*) mean?

d. *A*(*r*) is a function describing the area *A* of a circle with radius r in meters. What does *A*(*8*) mean? What does *A*-1(*8*) mean?

2. This question asks you to find the inverse (function) of a function given the function and a table of values. Remember: an inverse function undoes what a function does.

a. *f*(x) = 2*x* + 4

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| |  |  | | --- | --- | | ***x*** | ***f*(*x*)** | | -2 |  | | -1 |  | | 0 |  | | 1 |  | | 2 |  | | |  |  | | --- | --- | | ***x*** | ***f -1*(*x*)** | | 0 |  | | 2 |  | | 4 |  | | 6 |  | | 8 |  | |

b. *f*(x) = *x* + 6

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| |  |  | | --- | --- | | ***x*** | ***f*(*x*)** | | -6 |  | | -3 |  | | 0 |  | | 3 |  | | 6 |  | | |  |  | | --- | --- | | ***x*** | ***f -1*(*x*)** | |  |  | |  |  | |  |  | |  |  | |  |  | |

c. *f*(x) = *x* + 1

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| |  |  | | --- | --- | | ***x*** | ***f*(*x*)** | |  |  | |  |  | |  |  | |  |  | |  |  | | |  |  | | --- | --- | | ***x*** | ***f -1*(*x*)** | |  |  | |  |  | |  |  | |  |  | |  |  | |

d. *f*(x) = *x*2 + 3 with *x* ≥ 0

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| |  |  | | --- | --- | | ***x*** | ***f*(*x*)** | |  |  | |  |  | |  |  | |  |  | |  |  | | |  |  | | --- | --- | | ***x*** | ***f -1*(*x*)** | |  |  | |  |  | |  |  | |  |  | |  |  | |

e. 

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| |  |  | | --- | --- | | ***x*** | ***f*(*x*)** | |  |  | |  |  | |  |  | |  |  | |  |  | | |  |  | | --- | --- | | ***x*** | ***f -1*(*x*)** | |  |  | |  |  | |  |  | |  |  | |  |  | |

3. Sketch a graph of the inverse function for each function given. One function below does not have an inverse function. Can you figure out which function it is, and why it has no inverse function?

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| with *x* ≥ 0 |  |