A Reasonable Domain

Domains for exponential, quadratic, and linear functions often are all real numbers ($-\infty < x < \infty$) without the context of a real life problem. So what happens when we attach applicable significance to those functions?
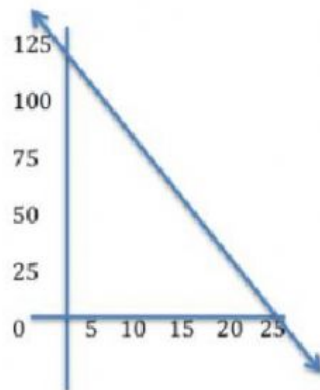
LINEAR
For example, let's say that Regina has $125 in her bank account and wants to purchase $5 meals for the homeless in her community.

The linear function that describes this situation is $f(x) = 125 - 5x$ where $f(x)$ represents the amount of money she has remaining and x represents the number of lunches she buys. What is an appropriate domain for this function?

Since Regina cannot buy negative meals, we must start with 0. Regina cannot buy ½ meals, so we must restrict the domain to whole numbers. Finally, Regina will run out of money when she buys the 25th meal. As a result, we know the domain is all whole numbers between 0 and 25.

Normally, this function's graph would look like this:

However, with the restricted domain, we would have this:
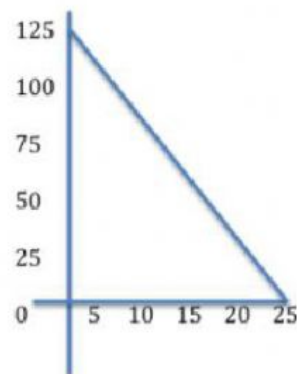
Note: The arrows must be removed in order to signify the restricted domain for this real world function.
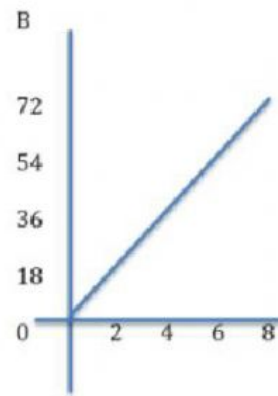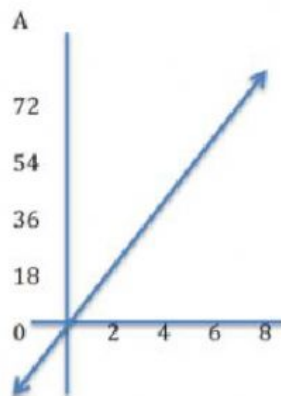
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Directions:

Domains for exponential, quadratic, and linear functions often are all real numbers ($-\infty < x < \infty$) without the context of a real life problem. So what happens when we attach applicable significance to those functions?

Read the problem to identify what the most appropriate domains would be within a given context. We normally cannot have negative money, negative time, or input values that go beyond the scope of the problem. Think critically to develop appropriate solutions.

1.) Josephine is 15 years old, so she can only work a maximum of 8 hours per day due to child labor laws. If she makes $9 per hour, what is the appropriate domain restriction for this problem? Why? Use a complete sentence.

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2.) Does graph A or B below show the appropriate domain restriction for the scenario in the 1st problem? Why?

A

B

A Reasonable Domain

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3.) Cassie deposits $135 into a special savings account that pays a rate of 2% per year for the first 10 years. If we want to find the value of the savings account for any year within this specific time period, what is the appropriate domain restriction within this context? Why? Use a complete sentence.

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4.) If Cassie inputs 121 into the function for the scenario above, has she made an appropriate choice within the context of the problem? Why? Use a complete sentence.

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A Reasonable Domain

5.) Vivian kicks a ball in the air, and this situation is modeled by the function $h(t) = -16t^2 + 32t$. What is the appropriate domain restriction within this context? Why? Use a complete sentence.

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6.) Does graph A or B below show the appropriate domain restriction for Vivian's scenario? Why?

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