

1. A town has an initial population of 20000. The town's population for the next 10 years is provided below. Which type of function would be most appropriate to model the town's population?

Year	1	2	3	4	5	6	7	8	9
Pop.	20150	20450	21350	24050	32150	56450	129350	348050	1004150

- A. Exponential
- B. Logarithmic
- C. Linear
- D. Non-Linear Power
- E. None of the above

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2. For the information below, construct a linear model that describes the total time T spent on the path in terms of the distance of a particular part of the path *if we know that the time spent on each path was equal.*

A bicyclist is training for a race on a hilly path. Their bike keeps track of their speed at any time, but not the distance traveled. Their speed traveling up a hill is 6 mph, 10 mph when traveling down a hill, and 8 mph when traveling along a flat portion.

- A. $0.392D$
- B. $480.000D$
- C. $24.000D$
- D. The model can be found with the information provided, but isn't options 1-3
- E. The model cannot be found with the information provided.

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3. Using the situation below, construct a linear model that describes the cost of the coffee beans $C(h)$ in terms of the weight of the high-quality coffee beans h .

Veronica needs to prepare 130 of blended coffee beans selling for \$4.67 per pound. She has a high-quality bean that sells for \$5.75 a pound and a low-quality bean that sells for \$3.80 a pound.

- A. $C(h) = 1.95h + 494.00$
 - B. $C(h) = 4.78h$
 - C. $C(h) = -1.95h + 747.50$
 - D. $C(h) = 5.75h$
 - E. None of the above.
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4. What is the **best** way to describe the domain of the scenario below?

Veronica needs to prepare 170 lbs of blended coffee beans to sell for \$4.71 per pound. She has a high-quality bean that sells for \$6.00 a pound and a low-quality bean that sells for \$3.25 a pound.

- A. Subset of the Integers
 - B. Subset of the Natural numbers
 - C. Proper subset of the Real numbers
 - D. Subset of the Rational numbers
 - E. There is no restricted domain in this scenario
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5. What is the **best** way to describe the domain of the scenario below?

Chemists commonly create a solution by mixing two products of differing concentrations together. A 10% and 30% solution can make an acid solution of some value between these, such as a 24% acid solution. The chemist wants to make differing solution percentages of 7 liters each.

- A. Proper subset of the Real numbers
- B. There is no restricted domain in this scenario
- C. Subset of the Rational numbers
- D. Subset of the Integers
- E. Subset of the Natural numbers

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6. For the information below, construct a linear model that describes the total time T spent on the path in terms of the distance of a particular part of the path *if we know that all parts of the path are equal length*.

A bicyclist is training for a race on a hilly path. Their bike keeps track of their speed at any time, but not the distance traveled. Their speed traveling up a hill is 7 mph, 12 mph when traveling down a hill, and 8 mph when traveling along a flat portion.

- A. $0.351D$
 - B. $27.000D$
 - C. $672.000D$
 - D. The model can be found with the information provided, but isn't options 1-3
 - E. The model cannot be found with the information provided.
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7. Using the situation below, construct a linear model that describes the cost of the coffee beans $C(h)$ in terms of the weight of the high-quality coffee beans h .

Veronica needs to prepare 150 of blended coffee beans selling for \$3.26 per pound. She has a high-quality bean that sells for \$3.96 a pound and a low-quality bean that sells for \$2.12 a pound.

- A. $C(h) = -1.84h + 594.00$
 - B. $C(h) = 1.84h + 318.00$
 - C. $C(h) = 3.04h$
 - D. $C(h) = 3.96h$
 - E. None of the above.
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8. For the information provided below, construct a linear model that describes her total income, I , as a function of the number of months, x she is at UF.

Aubrey is a college student going into her first year at UF. She will receive Bright Futures, which covers her tuition plus a \$600 educational expense each year. Before college, Aubrey saved up \$11000. She knows she will need to pay \$900 in rent a month, \$60 for food a week, and \$48 in other weekly expenses.

- A. $I(x) = 1332x$
- B. $I(x) = 1008x$
- C. $I(x) = 1332$
- D. $I(x) = 1008$
- E. None of the above.

9. For the information provided below, construct a linear model that describes her total income, I , as a function of the number of months, x she is at UF.

Aubrey is a college student going into her first year at UF. She will receive Bright Futures, which covers her tuition plus a \$800 educational expense each year. Before college, Aubrey saved up \$10000. She knows she will need to pay \$1200 in rent a month, \$70 for food a week, and \$64 in other weekly expenses.

- A. $I(x) = 1334x$
- B. $I(x) = 1736$
- C. $I(x) = 1334$
- D. $I(x) = 1736x$
- E. None of the above.

10. A town has an initial population of 60000. The town's population for the next 10 years is provided below. Which type of function would be most appropriate to model the town's population?

Year	1	2	3	4	5	6	7	8	9
Pop.	59900	59800	59600	59200	58400	56800	53600	47200	34400

- A. Logarithmic
 - B. Linear
 - C. Non-Linear Power
 - D. Exponential
 - E. None of the above
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