Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

***Variables and Patterns***

**Investigation 3.2**

***ACE***

Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Hour \_\_\_\_

**1. a.** Natasha charges $12 per hour for babysitting in her neighborhood. What

equation relates her pay for a job to the number of hours she works?

**b.** A gasoline service station offers 20 cents off the regular price per gallon

every Tuesday. What equation relates the discounted price to the regular

price on that day?

**c.** Write an equation to show how the perimeter of a square is related to the

length of a side of the square.

**d.** A middle school wants to have its students see a movie at a local theater. The total cost of the theater and movie rental is $1,500. What equation shows how the cost per student depends on the number of students who attend?

**4.** The equation *d* = 70*t* represents the distance in miles covered after traveling at 70 miles per hour for *t* hours.

**a.** Make a table that shows the distance traveled every half hour from 0 hours to 4 hours.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Time** | 0 |  |  |  |  |  |  |  |
| **Distance** |  |  |  |  |  |  |  |  |

**b.** Sketch a coordinate graph that shows the distance traveled between 0 and 4 hours.

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**c.** What is *d* when *t* = 2.5 hours? Explain how you found your answer.

**d.** What is *t* when *d* = 210 miles? Explain how you found your answer.

**e.** You probably made your graph by plotting points. In this situation, would it make sense to connect these points?

**5.** The table shows the relationship between the number of riders on a bike tour and the daily cost of providing box lunches.

**Bike Tour Box Lunch Costs**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Number of Riders | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Lunch Cost | $4.25 | $8.50 | $12.75 | $17.00 | $21.25 | $25.50 | $29.75 | $34.00 | $38.25 |

**a.** Explain in words and with an equation how lunch cost *L* depends on the number of riders *n*.

*words: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

*equation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

**b.** Use your equation to find the lunch cost for 25 riders.

**c.** How many riders could eat lunch for $89.25? Explain how you found your answer.

**For Exercises 26–30, write a formula for the given quantity.**

**26.** the area *A* of a rectangle with length *l* and width *w \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

**27.** the area *A* of a parallelogram with base *b* and height *h \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

**28.** the perimeter *P* of a rectangle with base *b* and height *h \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

**30.** the area *A* of a triangle with base *b* and height *h \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

**36.** You can calculate the average speed of a car trip if you know the distance and time traveled.

**a.** Complete the table below.

**Car Trips**

|  |  |  |
| --- | --- | --- |
| **Distance(mi)** | **Time(h)** | **Average Speed (mi/h)** |
| 145 | 2 |  |
| 110 | 2 |  |
| 165 | 2.5 |  |
| 300 | 5.25 |  |
| 446 | 6.75 |  |
| 528 | 8 |  |

**b.** Write a formula for calculating the average speed *s* for any given  
distance *d* and time *t*.