

1.3.D2 – FUNCTIONS REPRESENTED BY FORMULAS

1. In August 2000, the Russian submarine *Kursk* sank to a depth of 350 feet in the Barents Sea. The function $P(d) = 62.5d + 2117$ can be used to find the pressure (lb/ft²) at a depth of d feet below the surface of the water.
 - a. Evaluate and interpret: $P(350)$.

 - b. Solve: $P(d) = 10,000$

2. A Webmaster estimates that the time (in seconds) required to connect to the server when n people are connecting is given by $t(n) = 0.005n + 0.3$.
 - a. Evaluate and interpret: $t(50)$

 - b. Solve: $t(n) = 10$

3. A company that manufactures bicycles has a fixed cost of \$100,000. It costs \$100 to produce each bicycle. The total cost for the company is the sum of its fixed cost and variable costs.
 - a. Write a formula for the total cost, C , as a function of the number of bicycles produced, x .

 - b. Evaluate: $C(90)$

4. A car was purchased for \$22,500. The value of the car decreased by \$3200 per year for the first six years.
 - a. Write a formula for the value of the car, V , as a function of the number of years, x .

 - b. Evaluate: $V(6)$

5. In 2006, the population of a town was 18,310 and growing by 58 people per year.
 - a. Write a formula for the population of the town, P , as a function of the number of years since 2006, x .

 - b. Solve and interpret the result: $P(x) = 19,470$

6. A vehicle owner wants to calculate the total cost of his 2007 Jeep Compass with a MSRP of \$18,366. His monthly loan payment is \$317.54 for 5 years after he puts down a \$2000 down payment.
 - a. Write a formula for the total amount he has paid, T , toward the cost of the car (including the down payment) as a function of the number of months, m , he has made payments on the loan.

 - b. What is the total cost of the Jeep after he has made all of the payments?

 - c. How much money has he paid in interest for his Jeep?

7. The Sprint Fair & Flexible cell phone plan costs one professor \$35.10 a month, if she does not go over her allotted 200 anytime minutes. However, she must pay \$0.28 a minute for every minute over her limit.
- Write a formula for the monthly bill, B , as a function of the number of exceeded minutes, m .
 - If she talks a half-hour over her monthly limit, what will be the total amount of her monthly cell phone bill?
8. A theatre group is having a carwash fundraiser. The liquid soap costs \$34 and is enough to wash 40 cars. Each car is charged \$5. The profit, p , is a function of the total number of cars washed, c , minus costs.
- Write a function rule for the profit.
 - Identify the independent variable. What is the practical domain?
 - Identify the dependent variable. What is the practical range?
9. A plane was flying at an altitude A of 30,600 feet when it began the descent toward the airport. The airplane descends at a rate of 850 feet per minute. The altitude, A , is a function of the time, m , descending.
- Write a function rule that describes this situation.
 - Identify the independent variable. What is the practical domain?
 - Identify the dependent variable. What is the practical range?
10. Oakland Coliseum, once home of the Oakland Raiders, is capable of seating 63,026 fans. For each game, the amount of money that the Raider's organization brings in as revenue, R , is a function of the number of people n in attendance. The revenue of each ticket is \$30.
- Write a function rule that represents the situation.
 - Identify the independent variable. What is the practical domain?
 - Identify the dependent variable. What is the practical range?
11. In a factory, a certain machine needs 30 minutes to warm up. It takes 15 minutes for the machine to run a cycle. The total time the machine operates $T(n)$, in minutes, is a function of the number of cycles run, n . The machine can operate for as long as 6 hours per day including warm up time.
- Write a function rule that represents the situation.
 - Identify the independent variable. What is the practical domain?
 - Identify the dependent variable. What is the practical range?