Equations and Functions Practice

Definitions

Domain: the set of all input values x for which a function is defined.
Range: the set of all output values y the function can produce.

Example (table of values): $(-1, 2), (0, 2), (1, 1), (2, 4)$.
Domain $= \{-1, 0, 1, 2\}$, Range $= \{1, 2, 4\}$.

Problems

1. A movie theater sold 120 tickets. Adult tickets cost \$12 and student tickets cost \$8. The total revenue was \$1,240. How many of each ticket were sold?

2. Two numbers have sum 42 and difference 6. Find the numbers.

3. A mixture is made with \$3 per pound nuts and \$7 per pound nuts. A 20 lb mix costs \$110. How many pounds of each type?

4. A taxi charges a \$4 start fee plus \$2.50 per mile. Another company charges \$1.50 per mile with no start fee. For what distance do the costs match?

5. A school bought 15 calculators and 12 rulers for \$486. Calculators cost \$30 each and rulers cost \$3 each. Verify if the purchase total is possible; if not, find the correct total for those quantities.

6. A rectangle has perimeter 54 cm. Its length is 3 cm more than twice its width. Find its dimensions.

7. A farmer sold 68 pounds of apples. Some were sold at \$2 per pound and the rest at \$3 per pound. The total revenue was \$176. How many pounds were sold at each price?

8. A cell plan costs \$25 per month plus \$0.10 per text. Another plan costs \$35 per month plus \$0.05 per text. For how many texts do the plans cost the same?

9. A function is given by $f(x) = 3x + 2$. A plant is 8 cm tall at day 2. Interpret the slope and find the day when the plant is 26 cm tall.

10. The table shows a function g:

x	-2	-1	0	1	3
$g(x)$	5	3	1	3	9

State the domain and range.

11. A car rental costs \$45 per day plus \$0.20 per mile. Write a function for total cost and find the cost for 3 days and 120 miles.

12. A function is defined by $h(x) = \dfrac{2x - 5}{x + 1}$. State the domain in set notation.

13. A subscription cost is modeled by $C(t) = 120 - 4t$ for $0 \le t \le 20$. State the range of C.

14. A function is given by $p(x) = x^2 - 6x + 5$. Find the minimum value and the x-value where it occurs.

15. A function is given by a rule: for each x, the output is three less than twice the input. Write the function and evaluate it at $x = -4$.

16. The table shows a function m:

x	0	2	4	6
$m(x)$	7	3	-1	-5

Determine the average rate of change from $x = 0$ to $x = 6$, and state the domain.