

Algebra II Worksheet #5 Unit 3 Selected Solutions

A rectangular water tank is 8 feet long, 5 feet wide, and 4 feet deep. The tank is **half full** initially and water is pumped into the tank at 5 cubic feet per minute until the tank is full.

Let t represent the time that water has been pumped into the tank (in **minutes**). Let $f(t)$ represent the **depth of the water** in the tank (in **inches**).

17. How long will it take to fill the tank? **16 minutes**

$V = (8)(5)(4) = 160$ cubic feet. 80 cubic feet of water must be added to fill the tank. Since the water is pumped in at 5 cubic feet per minute, it will take 16 minutes to fill the tank.

$80 \text{ cubic feet} \div 5 \text{ cubic feet per minute} = 16 \text{ minutes.}$

18. Make a table giving t and $f(t)$ every 4 minutes from $t = 0$ until the tank is full.

t	$f(t)$
0	24 ← half full tank
4	30 (2 ft. = 24 in.)
8	36
12	42 (4 ft. = 48 in.)
16	48 ← full tank

The depth increases
24 inches in 16 minutes.

The depth increases at
1.5 inches per minute.

The slope of the graph is +1.5 !!

20. Write an equation giving $f(t)$ in terms of t .

The slope is 1.5. The y -intercept is 24. $y = mx + b$

$$\underline{\underline{f(t) = 1.5t + 24}}$$

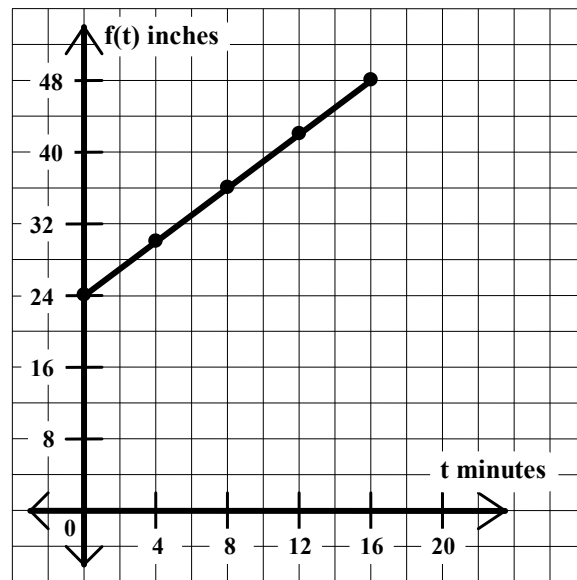
21. What is the domain of function f ?

$$\underline{\underline{[0, 16]}}$$

23. Evaluate $f(10)$. What does $f(10)$ represent in terms of the problem?

$f(10) = 39$ inches. $f(10)$ represents the depth of water in the tank after 10 minutes of filling.

19. Graph function f .



22. What is the range of function f ?

$$\underline{\underline{[24, 48]}}$$

24. If $f(t) = 33$, then find the value of t . Describe what this value of t represents in terms of the problem.

$t = 6$ minutes. This value of t represents the time it takes for the water in the tank to be 33 inches deep.