Integrated Honors
3.2 Notes

(opener)

(A) $h = 2 + 3(20) + 1.4(t-20)$

$h = 62 + 1.4(t-20)$

(B) $h(35) = 62 + 1.4(35-20)$

$= 62 + 1.4(15)$

$= 62 + 21 =$ **83 ft**

Example 1: A giant sequoia tree has an initial diameter of 4.320 meters and it grows 0.003 meters in diameter each year thereafter.

a.) Find an equation that models the diameter **d** of the tree after **t** years.

$d = 0.003t + 4.320$

b.) Find the diameter of the tree after 100 years.

$d(100) = 0.003(100) + 4.320$

$0.3 + 4.320$

$d = 4.620$ m

Example 2:

In one state, for speeding on a 65-mile-per-hour highway a person may be fined $50 as well as an additional $10 for each mile per hour over the speed limit.

18. Complete the table to show the total fine F for various speeds s.

Speed (mph)	Fine ($)
65	0
66	$50+10(1)=60$
67	$50+10(2)=70$
68	$50+10(3)=80$
69	$50+10(4)=90$
70	$50+10(5)=100$

19. Identify the independent and dependent variables. Explain your choices. indep: speed dep: fine The amount fined depends on the speed you drive.

20. Complete the following sentence to describe the way the fine depends on speed: "The total fine is $50 plus _____." "$10 for every mph over 65 mph"

21. Write an equation that models the total fine F (in dollars) for any speed s that is at least 65 mph. $F = 50 + 10(s-65)$

22. Find the total fine if a person is caught going 78 miles per hour.

$F(78) = 50 + 10(78-65)$

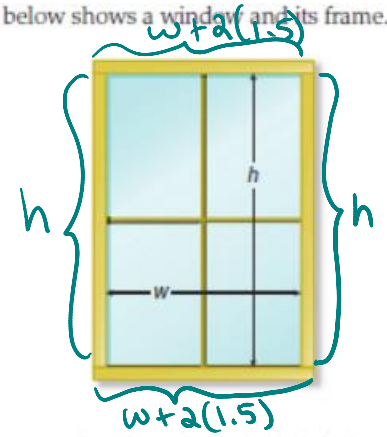
$= 50 + 10(13)$

$= 50 + 130$

$F = \$180$

Example 3:

The figure below shows a window and its frame.



a. Write an equation that relates the height h and width w of the inside dimensions of the window to the total length L of framing material needed for 20 identical windows in a house. (Assume that the frame is $1\frac{1}{2}$ inches wide.)

$$L = 20[2h + 2(w+3)]$$

b. How much framing material is needed if each window is 2 feet wide and 3 feet high?

$w = 2\text{ ft} = 24\text{ in}$

$h = 3\text{ ft} = 36\text{ in}$

$$L = 20[2(36) + 2(24+3)]$$

$$L = 20[72 + 2(27)]$$

$$L = 20[72 + 54]$$

$$= 20[126]$$

$$L = 2520'' \text{ or } 210'$$