

Correct Yesterday's entertainment:  
pg. 51 #1bdf, 2bdf, 3a, 4a, 5d, 7, 9, 14, 15

p. 52

7. Many income tax systems are calculated using a tiered method. Under a certain tax law, the first \$100 000 of earnings are subject to a 35% tax; earnings greater than \$100 000 and up to \$500 000 are subject to a 45% tax. Any earnings greater than \$500 000 are taxed at 55%. Write a piecewise function that models this situation.

$$f(x) = \begin{cases} 0.35x & [0, 100\,000] \\ 0.45x - 10\,000 & (100\,000, 500\,000] \\ 0.55x & (500\,000, \infty) \end{cases}$$

if  $x = 100\,000$   
 $y = 0.35(100\,000)$   
 $= 35\,000$

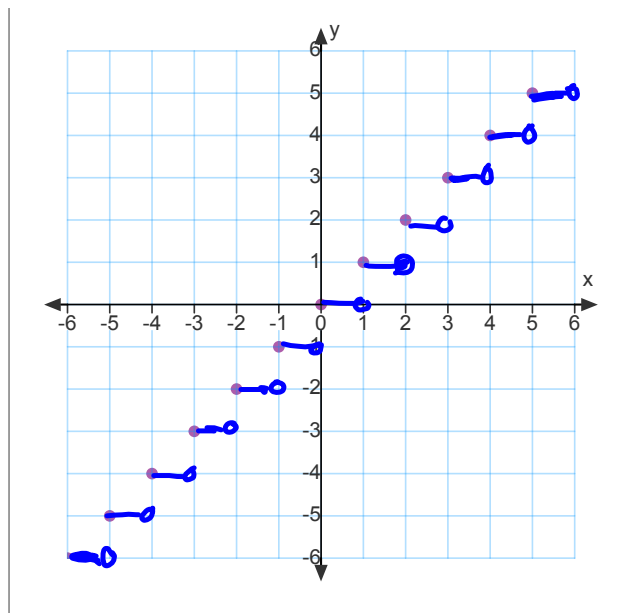
if  $x = 101\,000$   
 $y = 35\,000 + 0.45(x - 100\,000)$   
 $= 35\,000 + 0.45x - 45\,000$   
 $= 0.45x - 10\,000$

if  $x = 500\,000$

$$\begin{aligned} & 0.45(500\,000) - 10\,000 \\ &= 225\,000 - 10\,000 \\ &= 215\,000 \end{aligned}$$

$$\begin{aligned} y &= 0.55(x - 500\,000) + 215\,000 \\ &= 0.55x - 275\,000 + 215\,000 \\ &= 0.55x - 60\,000 \end{aligned}$$

- p. 53 15. The *greatest integer function* is a step function that is written as  $f(x) = [x]$ , where  $f(x)$  is the greatest integer less than or equal to  $x$ . In other words, the greatest integer function rounds any number down to the nearest integer. For example, the greatest integer less than or equal to the number  $[5.3]$  is 5, while the greatest integer less than or equal to the number  $[-5.3]$  is  $-6$ . Sketch the graph of  $f(x) = [x]$ .



15.

