



a) SOLVE THE EQUATION
 $f(x) = g(x)$

b) SOLVE THE INEQUALITY
 $f(x) \leq g(x)$

a) $f(x) = g(x) \Rightarrow$ intersection $\Rightarrow (2, 5) \Rightarrow$ $x=2$
 $y=5$

b) $(-\infty, 2)$ $g(x) > f(x)$
 $x=2$ $g(x) = f(x) \Rightarrow (-\infty, 2]$ $f(x) \leq g(x)$

IN 2002, MAJOR LEAGUE BASEBALL SIGNED A LABOR AGREEMENT WITH THE PLAYERS. IN THIS AGREEMENT, ANY TEAM WHOSE PAYROLL EXCEEDED 136.5 MILLION IN 2006 HAS TO PAY A LUXURY TAX OF 40% (FOR SECONDS OFFENSES). THE LINEAR FUNCTION $T(p) = 0.4(p - 136.5)$ DESCRIBES THE LUXURY TAX T OF A TEAM WHOSE PAYROLL WAS p (IN MILLIONS OF DOLLARS)

a) WHAT IS THE IMPLIED DOMAIN OF THIS LINEAR FUNCTION?
 $T(p) \geq 0$ $T(p) = 0 \Rightarrow p = 136.5 \Rightarrow D: (136.5, \infty)$

b) WHAT WAS THE LUXURY TAX FOR THE NEW YORK YANKEES WHOSE 2006 PAYROLL WAS 171.1 MILLION? $\Rightarrow p = 171.1$

$$T(171.1) = 0.40(171.1 - 136.5) = 0.4(34.6) = 13.84 \text{ MILLION}$$

c) WHAT IS THE PAYROLL OF THE TEAM THAT PAYS A LUXURY TAX OF 11.7 MILLION?

$$11.7 = 0.40(p - 136.5)$$

$$11.7 = 0.4p - 54.6$$

$$66.3 = 0.4p \Rightarrow p = 165.75 \text{ MILLION}$$

BREAK-EVEN POINT COST = REVENUE
 $C(x) = R(x)$

$$R(x) = 12x$$
$$C(x) = 10x + 15,000$$

a) FIND THE FIRM'S BREAK-EVEN POINT

$$12x = 10x + 15000$$
$$2x = 15000$$
$$x = 7500$$

b) FIND THE VALUES OF x SUCH THAT $R(x) > C(x)$

$$12x > 10x + 15000$$
$$2x > 15000$$
$$x > 7500$$

FIND THE SLOPE OF LINEAR FUNCTIONS. DETERMINE IF THE LINE IS INCREASING, DECREASING OR CONSTANT.

$$\frac{1}{2}x - 3y - 4 = 0$$
$$\left(-\frac{1}{3}\right) - 3y = \left(4 - \frac{1}{2}x\right) \cdot \left(-\frac{1}{3}\right)$$
$$y = \frac{1}{6}x - \frac{4}{3}$$

$$m = \frac{1}{6} > 0 \Rightarrow \text{increasing}$$

$$3x + 5y = 15$$

$$\frac{5y}{5} = \frac{-3x + 15}{5}$$
$$y = -\frac{3}{5}x + 3$$

$$m = -\frac{3}{5} < 0$$

decreasing