Math 111 F09N01 - Quiz 2 Name: SOLUTIONS.
Sep 25 2009 Stu#:

(1) [**8 points**] A coffee company wants to mix two varieties of coffee to come up with a new blend. Variety A sells for \$22.95 per pound and variety B sells for \$6.75 per pound. The new blend is to sell for \$10.80 per pound. If the company wishes to produce 100 pounds of the new blend, how much of each variety should be used so that the total revenue from the new blend is the same as the revenue from the ingredient varieties?

Let x = pounds of A
y = pounds of B

$\therefore \quad x+y = 100$

$22.95x + 6.75y = (100)(10.80)$

$\therefore \quad x+y=100 \quad (1)$
$22.95x + 6.75y = 1080 \quad (2)$

Using (1): $y = 100 - x$
sub. into (2): $22.95x + 6.75(100-x) = 1080$
$22.95x + 675 - 6.75x = 1080$
$16.2x = 405$
$x = 25$

$\therefore \quad y = 100 - x = 100 - 25 = 75$

$\therefore$ 25 pounds of variety A and 75 pounds of variety B should be used.

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(2) [**7 points**] The supply equation for a good is $S = 2p + 5$. At price $p = \$1$ the demand is $D = 19$. Assuming a linear demand equation and a market price of $p = \$3$, determine the demand equation.

At $p = 3$, $S = 2(3) + 5 = 11$

$\therefore$ $(3, 11)$ is a point on both the supply line and the demand line (since $p = 3$ is market price.)

$\therefore$ demand line is the line through $(3, 11)$ and $(1, 19)$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{19 - 11}{1 - 3} = \frac{8}{-2} = -4$$

$$\therefore \quad D - 11 = -4(p - 3)$$

or $\quad D = -4p + 12 + 11$

i.e $\quad \boxed{D = -4p + 23}$