Math 120 Autumn 2012
Final Exam
December 8, 2012
Answers

1. (a) $B(x) = \frac{1}{15}x + \frac{49}{15}$ (b) $G(x) = 0.378x + 12.56$ (c) 17.64%

2. 14.6189 years after 2005

3. (a) The partitioned square should have sides of length $\frac{392}{13}$ meters and the other square should have sides of length $\frac{224}{13}$ meters.

   (b) To maximize the sum of the areas, the unpartitioned square should have sides of length 70 meters, and the partitioned square should have sides of length 0 meters.

4. 1.75204 km

5. 3.5 hours

6. (a) 11.5 is the only fixed point; (b) $h^{-1}(x) = 25 - 3x, x \geq 8$.

7. (a) $\omega = \frac{\pi}{2}$ rad/min, $v = \frac{175\pi}{4}$ ft/min (b) $h(t) = 112.5 + 87.5\sin(-\frac{\pi}{2} + \frac{\pi}{2}t)$ (c) 111.3552872 feet

8. (a) $x_A = t, y_A = \frac{11}{6}t$ (b) $x_M = 70 - 2t, y_M = 80$ (c) 31.76 feet