Math 120 - Autumn 2007
Final Exam
December 8, 2007
Answers

1. (a) $C = 16 + \dfrac{3}{4}(t-1)$

   (b) $I = 68 + \dfrac{7}{6}t$

   (c) 20.54 years after 2001.

2. (a) $y = 15 \cdot 0.97516913973641^t$

   (b) About 10.55 grams.

   (c) 80.13 years after 1982, or the year 2062.

3. Isobel will have 202 pairs of shoes after 11 years of marriage.

4. (a) $x = 10 - 2t, y = 20 - 4t$; (b) $x = 30 - 15t, y = 0$; (c) 1.8378 seconds after they start moving.

5.

$$D(t) = \begin{cases} 2t & \text{if } 0 \le t \le 3 \\ \sqrt{6^2 + (3(t-3))^2} & \text{if } 3 \le t \le 4 \\ \sqrt{(6 + 5(t-4))^2 + 3^2} & \text{if } 4 \le t \le 6 \end{cases}$$

6. (a) $(31/5, 31)$ (b) 48.05 feet

7. $29/3$ seconds

8. (a) $(99.178, 12.796)$ (b) 4.472135955 seconds

9. (a) The graph is an upward opening parabola-like curve, symmetric about the y-axis, lying below the x-axis, passing through $(-1/2, 0)$, $(0, -1)$, and $(1/2, 0)$.

   (b) The domain is $-1/2 \le x \le 1/2$.

   (c) The range is $-1 \le y \le 0$.