

Math 120 - Autumn 2014  
Final Exam  
December 6, 2014  
Answers

1.  $\frac{4 \tan 6^\circ}{\tan 7^\circ - \tan 6^\circ} = 23.77880078\dots$  minutes

2.  $\sqrt{\frac{300304}{37}} = 90.0906450433\dots$  feet

3. (a)  $g(t) = 70 (2^{t/5})$   
(b)  $c(t) = 31.5818(1.1606)^t$   
(c) 223.806 seconds

4. (a)

$$A(t) = \begin{cases} 120t + 8000 & \text{if } 0 \leq t \leq 5 \\ 8495 - 15(t - 12) & \text{if } 5 \leq t \leq 12 \end{cases}$$

(b)  $t = 4.5$  and  $t = 9$

5. (a) 0.875 hours after starting

(b)  $x = 2 \cos(0.1\pi + 1.6\pi t), y = 2 \sin(0.1\pi + 1.6\pi t)$

(c) 1.58859156... km

6.  $w = 10$

7. (a)  $f(t) = \frac{60t + 300}{t + 30}$

(b)  $f^{-1}(y) = \frac{300 - 30y}{y - 60}$ .

8. (a)  $f(t) = 38 + 2 \sin\left(\frac{2\pi}{14}(t - 13.5)\right)$

(b) 12.8304301... hours