Spring 2012 Math 151

Week in Review # 1
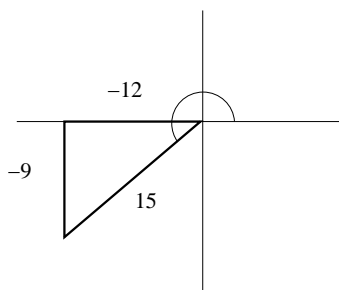sections: Review, Appendix D, 1.1
courtesy: Joe Kahlig

1. (a) $f(x) = \dfrac{x+1}{x^{7/3} - 3x^{4/3} - 10x^{1/3}} = \dfrac{x+1}{\sqrt[3]{x}(x^2 - 3x - 10)} = \dfrac{x+1}{\sqrt[3]{x}(x-5)(x+2)}$

   Domain: $(-\infty, -2) \cup (-2, 0) \cup (0, 5) \cup (5, \infty)$

   (b) $\sqrt{x^2 - 4}$ has a domain of $(-\infty, -2] \cup [2, \infty)$
   $\sqrt{x-5}$ has a domain of $[-5, \infty)$

   Answer: Domain is $(-5, -2] \cup [2, \infty)$

2. use a right triangle. be sure that you take into consideration that θ is in Quadrant III.

   $\sin(\theta) = \dfrac{-9}{15}$ $\qquad$ $\cos(\theta) = \dfrac{-12}{15}$

   $\csc(\theta) = \dfrac{-15}{9}$ $\qquad$ $\sec(\theta) = \dfrac{-15}{12}$

   $\cot(\theta) = \dfrac{12}{9}$

3. use triangles to find that $\cos(x) = \dfrac{\sqrt{35}}{6}$, $\cos(y) = \dfrac{15}{17}$, and $\sin(y) = \dfrac{8}{17}$

   (a) $2 * \dfrac{1}{6} * \dfrac{\sqrt{35}}{6} = \dfrac{\sqrt{35}}{18}$

   (b) $\dfrac{\sqrt{35}}{6} * \dfrac{15}{17} - \dfrac{1}{6} * \dfrac{8}{17}$

   (c) $\dfrac{1}{6} * \dfrac{15}{17} - \dfrac{\sqrt{35}}{6} * \dfrac{8}{17}$

4. $b^2 = 5^2 + 4^2 - 2 * 5 * 4 \cos(25)$
   $b = 2.1789$

5. (a) $\theta = 0, \dfrac{2\pi}{3}, \dfrac{4\pi}{3}, 2\pi$

   (b) $x = \dfrac{\pi}{12}, \dfrac{5\pi}{12}, \dfrac{13\pi}{12}, \dfrac{17\pi}{12}$

6. $\overrightarrow{BA} = \langle 4, -9 \rangle$.

7. (a) $\sqrt{29}$
   (b) $8\mathbf{i} - 7\mathbf{j}$ or $\langle 8, -7 \rangle$
   (c) $s = -2, t = 7$
   (d) $\left\langle \dfrac{4}{\sqrt{17}}, \dfrac{1}{\sqrt{17}} \right\rangle$
   (e) $\left\langle \dfrac{-12}{\sqrt{17}}, \dfrac{-3}{\sqrt{17}} \right\rangle$

8. $R = \left\langle 4, 2\sqrt{3} \right\rangle$
   $|R| = \sqrt{28}$
   $\theta = arctan\left(\dfrac{2\sqrt{3}}{4}\right) = 40.89^o$

9. $\theta = 17.46^o$

10. speed $= 194.23$mph
    bearing $= $ N33.53^{o}E