Spring 2012 Math 151

Week in Review # 2
sections: 1.2, 1.3, 2.2
courtesy: Joe Kahlig

Section 1.2

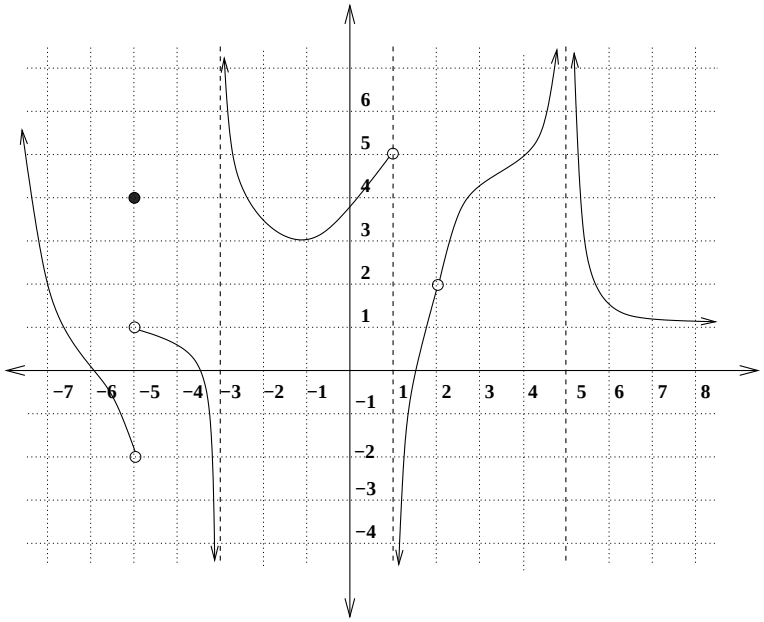
1. Find $\mathbf{a} \cdot \mathbf{b}$ given the following information:
   (a) $\mathbf{a} = \langle -3, 5 \rangle$ and $\mathbf{b} = \langle 1, 2 \rangle$
   (b) $|\mathbf{a}| = 5$, $|\mathbf{b}| = 12$, and the angle between $\mathbf{a}$ and $\mathbf{b}$ is $60°$.
2. Find the angle between the vectors $\langle 3, 2 \rangle$ and $\langle -2, 1 \rangle$
3. Find the value(s) of x so that the following vectors are orthogonal:
   $\mathbf{a} = \langle 2x, 5 \rangle$ and $\mathbf{b} = \langle x, x - 5 \rangle$
4. Find the scalar and vector projection of $< -2, 1 >$ onto $< 6, 1 >$.
5. Find the value of x so that vector projection of $\mathbf{b} =< x, 7 >$ onto $\mathbf{a} =< 1, 4 >$ is $< 5, 20 >$
6. Find the distance from the point $(4, 0)$ to the line $y = 2x + 1$.
7. A constant force of $\mathbf{F} = 12\mathbf{i} + 15\mathbf{j}$, magnitude is in Newtons, moves an object along a straight line from the point $(1, 5)$ to the point $(6, 8)$. Find the work done if the distance is measured in meters.
8. A crate is pulled on a level surface for a distance of 50m under a constant force of 25N. The force is applied at an angle of $20°$ with the ground. Find the work done to move the crate.

Section 1.3

9. Find a Cartesian equation for the following parametric curves. Sketch the curve.
   (a) $x = 3t + 4$, $y = 5 - t$, $-2 \le t \le 4$
   (b) $x = 4\sin\theta$, $y = 2\cos\theta$, $0 \le \theta \le \pi$
   (c) $\mathbf{r}(\theta) = \langle 2cos(\theta), sec(\theta) \rangle$, $\dfrac{-\pi}{2} < \theta < \dfrac{\pi}{2}$
10. An object is moving in the xy-plane and its position after t seconds is $\mathbf{r}(t) = \langle 4t^2 - 3, 2t - 1 \rangle$
    (a) Does the object go thru the point$(32, 5)$? If so, at what value of t does this happen?
    (b) Does the object go thru the point$(141, 11)$? If so, at what value of t does this happen?
    (c) Find the Cartesian equation of the curve and sketch the curve.
11. Find parametric equations and the vector equation for the line described below:
    (a) The line passes thru the points $(0, 3)$ and $(-3, 5)$.
    (b) The line passes thru the point $(-1, 5)$ and is parallel to the line $x = 2 + 3t$, $y = 5 + 2t$
12. Determine whether the following lines are parallel or perpendicular. If they are not parallel, find the point of intersection.
    $L_1(t) =< 1 + t, 8 + 3t >$
    $L_2(s) =< 3 - s, 7 - 2s >$

Section 2.2

Use the graph of $f(x)$ to answer questions 13-21



13. $\lim_{x \to -5^-} f(x) =$

14. $\lim_{x \to -5^+} f(x) =$

15. $\lim_{x \to -5} f(x) =$

16. $\lim_{x \to -1} f(x) =$

17. $\lim_{x \to 2} f(x) =$

18. $\lim_{x \to -3} f(x) =$

19. $\lim_{x \to 5} f(x) =$

20. $\lim_{x \to \infty} f(x) =$

21. Find the equation(s) of all vertical asymptotes.

22. Find all holes and vertical asymptote(s) for the graph of $g(x) = \dfrac{(x^2+4x)(x-8)}{x^2(x^2+2x-8)}$ and determine the behavior of the function near the vertical asymptotes.