

Fall 2021 Math 151

Week in Review 2

courtesy: Amy Austin

(covering appendix J₃, 1.5, 2.2)

1. Sketch the parametric curves described below. Indicate with an arrow the direction in which the curve is traced out as t increases. What is the cartesian equation of the curve?

a.) $x = t - 4, y = 3t + 1$

b.) $x = \sqrt{t}, y = 1 - t$

c.) $x = 2 \sin \theta, y = 3 \cos \theta$

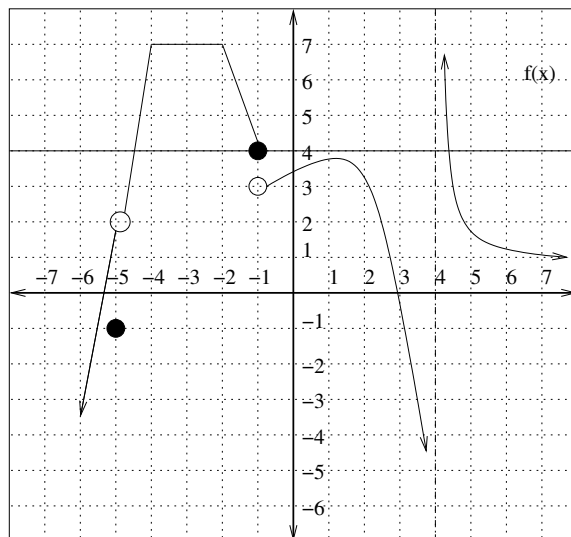
d.) $\mathbf{r}(t) = \langle 2 + \sin t, 3 + \cos t \rangle, 0 \leq t \leq \pi$

2. Find a vector equation of the line passing through the point $(1, 3)$ and parallel to the vector $\langle -2, 6 \rangle$.
3. Find a vector equation of the line with slope $\frac{2}{3}$ and passing through the point $(-2, 2)$
4. Find parametric equations for the line passing through the points $(8, 3)$ and $(-5, 2)$.
5. Find a vector perpendicular to the line $2x + 5y = 8$.
6. Determine whether the following lines are parallel or perpendicular. If they are not parallel, find the point of intersection.

L1: $\mathbf{r}(t) = (-4 + 2t)\mathbf{i} + (5 + t)\mathbf{j}$

L2: $\mathbf{r}(t) = (2 + 3t)\mathbf{i} + (4 - 6t)\mathbf{j}$

7. Use the graph of $f(x)$ below to compute the following limits, or explain why the limit does not exist.



- a) $\lim_{x \rightarrow -1^-} f(x)$ b) $\lim_{x \rightarrow -1^+} f(x)$
- c) $\lim_{x \rightarrow -1} f(x)$ d) $\lim_{x \rightarrow -5} f(x)$
- e) $\lim_{x \rightarrow 4^+} f(x)$ f.) $\lim_{x \rightarrow -2} f(x)$
8. Find $\lim_{x \rightarrow -2} \frac{x-1}{x+2}$ or explain why it does not exist.
9. Find $\lim_{x \rightarrow 3} \frac{x-5}{x^2-9}$ or explain why it does not exist.
10. Find $\lim_{x \rightarrow 4} \frac{x-1}{(x-4)^2}$ or explain why it does not exist.