# Math 151- Week-In-Review 2

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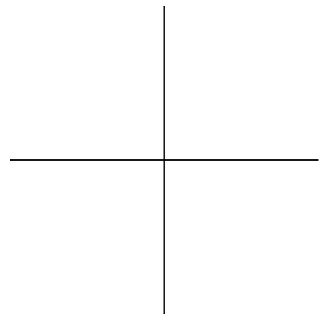
## Problem Statements

1. Find the scalar and vector projection of $\langle 3, 2\rangle$ onto $\langle -1, 5\rangle$.

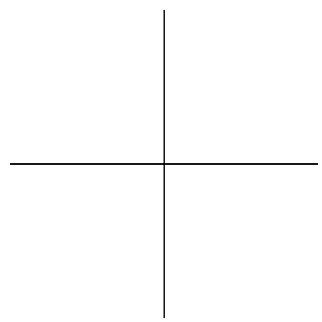
2. Find the distance from the point $(-1, 5)$ to the line $3x + 2y = 5$.

3. Eliminate the parameter to find the Cartesian equation of each curve below. Sketch the parametric curves and indicate the direction in which the curve is traced with an arrow.

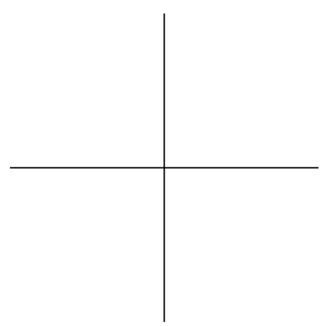
   (a) $x = 5 - t$, $y = 2t - 2$



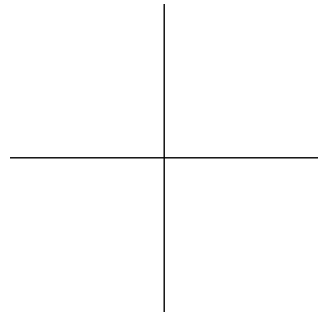
   (b) $x = 3t + 1$, $y = t^2 - 4$



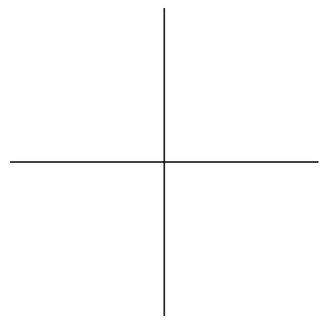
   (c) $x = \cos(\theta) + 3$, $y = \sin(\theta) - 5$, $0 \leq \theta \leq 2\pi$



(a) $\mathbf{r}(t) = \langle \sqrt{t}, 2t - 5 \rangle$



(b) $\mathbf{r}(t) = \langle \sin(\theta), \csc^2(\theta) \rangle$



4. (a) Find a vector equation of the line passing through the points $(2, 5)$ and $(-1, 8)$.

   (b) Find a vector passing through the point $(2, 5)$ and perpendicular to the line in part (a).

   (c) Find a vector that is perpendicular to the line $3x - 7y = 4$.

5. Determine if the following lines are perpendicular, parallel, or neither. If they are not parallel, find the point of intersection.
   $L_1 : \langle 5 - 3t, t + 1 \rangle$
   $L_2 : \langle 4s + 1, 12s + 1 \rangle$

6. Find the exact value of the expression.
   (a) $\arctan\left(\frac{\sqrt{3}}{3}\right)$

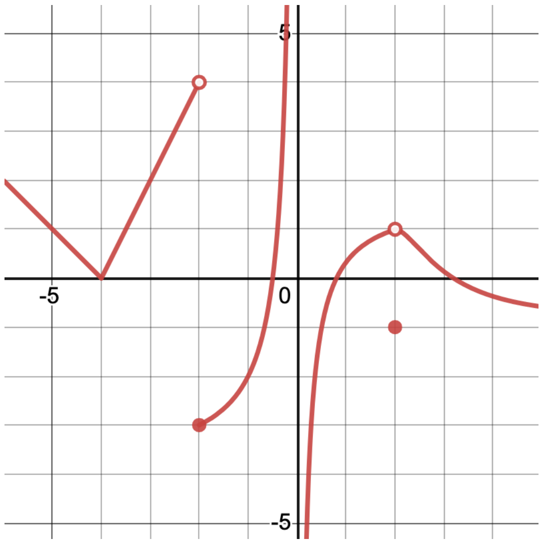
   (b) $\arccos\left(-\frac{\sqrt{3}}{2}\right)$

   (c) $\sin\left(2 \cdot \sin^{-1}\left(\frac{3}{4}\right)\right)$

7. Simplify the expression.
   (a) $\tan(\arcsin(x))$

   (b) $\sin(\tan^{-1}(x))$

8. State the value of the given quantity, if it exists, from the given graph of $f(x)$ below.




$\lim_{x\to -4^-} f(x)$ $\lim_{x\to -2^-} f(x)$ $\lim_{x\to 0^-} f(x)$ $\lim_{x\to 2^-} f(x)$

$\lim_{x\to -4^+} f(x)$ $\lim_{x\to -2^+} f(x)$ $\lim_{x\to 0^+} f(x)$ $\lim_{x\to 2^+} f(x)$

$\lim_{x\to -4} f(x)$ $\lim_{x\to -2} f(x)$ $\lim_{x\to 0} f(x)$ $\lim_{x\to 2} f(x)$

$f(-4)$ $f(-3)$ $f(0)$ $f(2)$