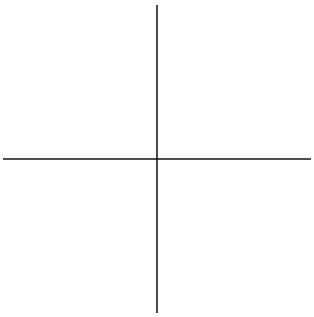
Math 151- Week-In-Review 2

Alexandra L. Foran

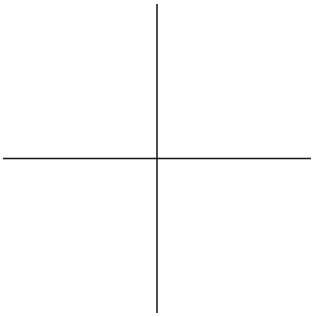
Problem Statements

1. 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.

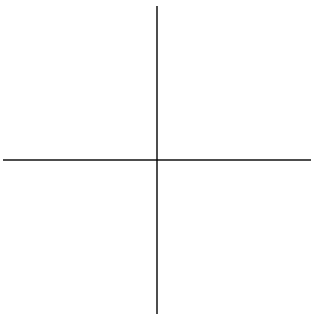
   (a) $x = 5 - t$, $y = 2t - 2$



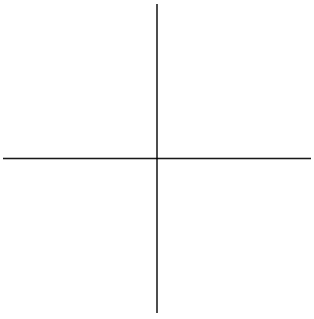
   (b) $x = 3t + 1$, $y = t^2 - 4$



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



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



2. (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 $3x - 7y = 4$.

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

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

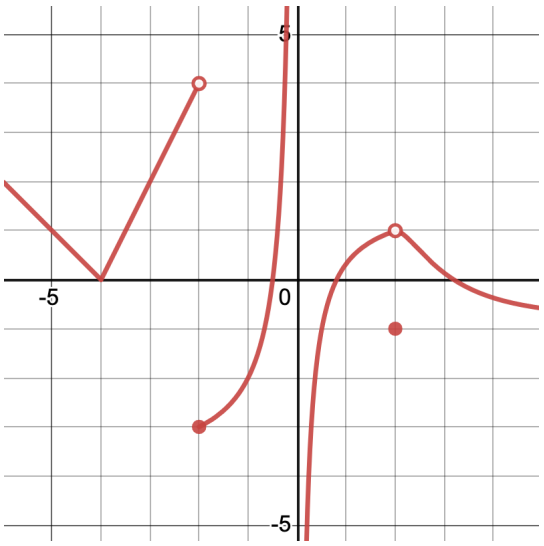
   (b) $\arccos\left(-\frac{\sqrt{3}}{2}\right)$

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

5. Simplify the expression.
   (a) $\tan\left(\arcsin\left(x\right)\right)$

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

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



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

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

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

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

7. Find the limit.

(a) $\lim_{x\to 5} \dfrac{-1}{(x-5)^6}$

(b) $\lim_{x\to 5} \dfrac{-1}{(x-5)^5}$

(c) $\lim_{x\to 5} \dfrac{x-5}{x^2+2x+1}$

(d) $\lim_{t\to 0} \dfrac{t^2-5t}{t^2+3t}$

(e) $\lim_{t\to 1} \dfrac{\sqrt{2-t}-1}{t-1}$

(f) $\lim_{h\to 0} \dfrac{(5-h)^{-1}-5^{-1}}{h}$