Calculus I
Chapter 1 and 2 Test Review

1. Evaluate the expression $\sec(\arctan\frac{2}{3})$ without using a calculator.

2. Solve: $3^{x-5} = 27$

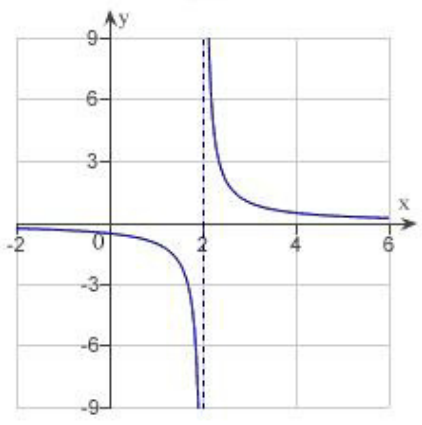
3. Complete the table and use the result to estimate the limit.

$$\lim_{x \to 3} \frac{x-3}{x^2 - 16x + 39}$$

x	2.9	2.99	2.999	3.001	3.01	3.1
$f(x)$						

4. Determine the following limit. (Hint: Use the graph to calculate the limit.)

$$\lim_{x \to 2} \frac{1}{x-2}$$



5. Find the limit by algebraic evaluation.

$$\lim_{x \to 6} \frac{x}{x^2 + 8}$$

6. Find the limit.

$$\lim_{x \to 5} \cos\left(\frac{\pi x}{6}\right)$$

7. Find the limit (if it exists) using algebraic techniques.

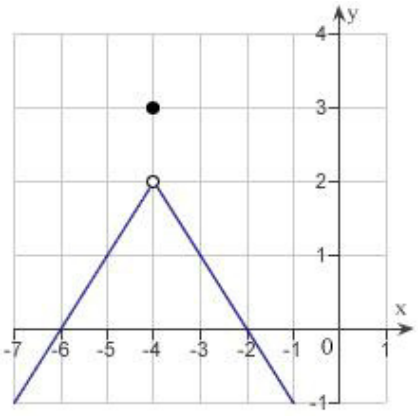
$$\lim_{x \to -8} \frac{x + 8}{x^2 - 64}$$

8. Find the limit (if it exists) using the conjugate method.

$$\lim_{x \to 5} \frac{\sqrt{x+4} - 3}{x - 5}$$

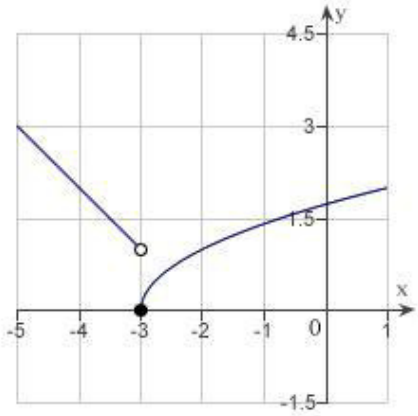
9. Use the graph as shown to determine the following limits, and discuss the continuity of the function at $x = -4$.

(i) $\lim_{x \to -4^+} f(x)$ (ii) $\lim_{x \to -4^-} f(x)$ (iii) $\lim_{x \to -4} f(x)$



10. Use the graph to determine the following limits, and discuss the continuity of the function at $x = -3$.

(i) $\lim_{x \to -3^+} f(x)$ (ii) $\lim_{x \to -3^-} f(x)$ (iii) $\lim_{x \to -3} f(x)$



11. Find the limit (if it exists).

$$\lim_{x \to 11^+} \frac{11 - x}{x^2 - 121}$$

12. Discuss the continuity of the function $f(x) = \dfrac{x^2 - 4}{x - 2}$.

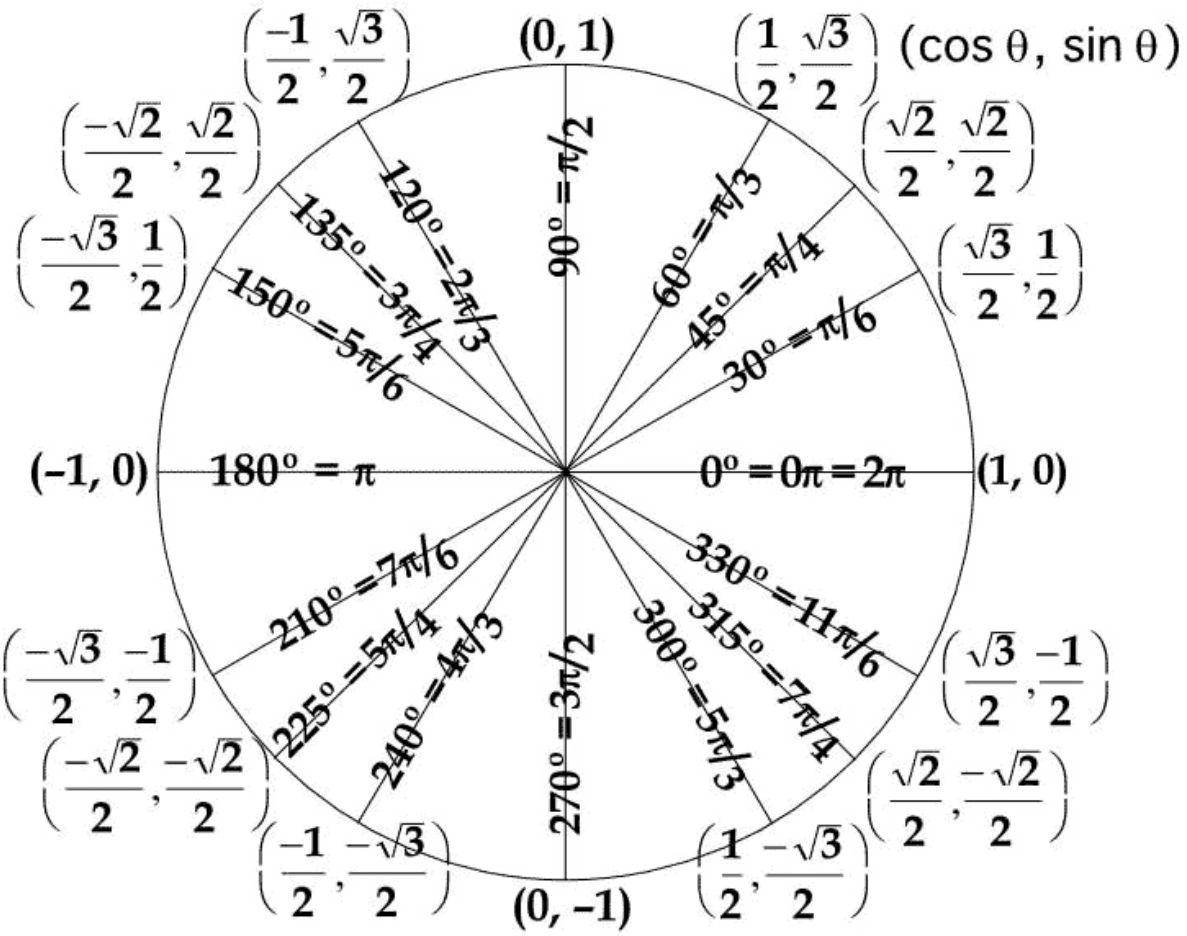
13. Find the x-values (if any) at which the function $f(x) = \dfrac{x + 2}{x^2 + 6x + 8}$ is not continuous. Which of the discontinuities are removable?

14. Find the limit.

$$\lim_{x \to 14^+} \frac{x - 3}{x - 14}$$

15. Find the limit.

$$\lim_{x \to 0^-} \left(x^2 - \frac{1}{x} \right)$$


(cos θ, sin θ)
(0, 1)
$\left(\frac{-1}{2}, \frac{\sqrt{3}}{2}\right)$
$\left(\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$
$\left(\frac{-\sqrt{2}}{2}, \frac{\sqrt{2}}{2}\right)$
$\left(\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}\right)$
$\left(\frac{-\sqrt{3}}{2}, \frac{1}{2}\right)$
$\left(\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$
90° = π/2
120° = 2π/3
135° = 3π/4
150° = 5π/6
60° = π/3
45° = π/4
30° = π/6
(–1, 0)
180° = π
0° = 0π = 2π
(1, 0)
210° = 7π/6
225° = 5π/4
240° = 4π/3
330° = 11π/6
315° = 7π/4
300° = 5π/3
$\left(\frac{-\sqrt{3}}{2}, \frac{-1}{2}\right)$
$\left(\frac{\sqrt{3}}{2}, \frac{-1}{2}\right)$
$\left(\frac{-\sqrt{2}}{2}, \frac{-\sqrt{2}}{2}\right)$
$\left(\frac{\sqrt{2}}{2}, \frac{-\sqrt{2}}{2}\right)$
270° = 3π/2
$\left(\frac{-1}{2}, \frac{-\sqrt{3}}{2}\right)$
$\left(\frac{1}{2}, \frac{-\sqrt{3}}{2}\right)$
(0, –1)