WORKSHEET: SECTION 2-3 DAY TWO

Evaluate each limit. Show your work or explain your reasoning.

1. $\lim_{h\to 0} \dfrac{(-9+h)^2 - 81}{h}$

2. $\lim_{t\to 8}(1+\sqrt[3]{t})(2-t^2)$

   Direct Substitution Property If f is a polynomial or a rational function and a is in the domain of f, then

   $$\lim_{x\to a} f(x) = f(a)$$

3. $\lim_{\theta\to 4} \dfrac{\theta^2 - 4\theta}{\theta^2 - \theta - 12}$

4. $\lim_{x\to 4} \dfrac{x^2}{x^2 - x - 12}$

5. $\lim_{x\to -3} \dfrac{\frac{1}{3} + \frac{1}{x}}{x+3}$

6. Write $\frac{|x|}{x}$ as a piecewise-defined function. $\lim_{x\to 0^-} \frac{|x|}{x}$ $\lim_{x\to 0+} \frac{|x|}{x}$

7. $\lim_{x\to 0} \frac{|x|}{x}$

8. $\lim_{x\to 5^-} \frac{3x-15}{|5-x|}$

9. The Squeeze Theorem If $f(x) \le g(x) \le h(x)$ when x is near a (except possibly a) and

$$\boxed{\lim_{x\to a} f(x) = \lim_{x\to a} h(x) = L}$$

then

$$\boxed{\lim_{x\to a} g(x) = L}$$

Problem: show that

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

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