L'Hôpital's Rule - Answers

For questions 1 – 12 Use L'Hospital's Rule to evaluate each of the following limits.

1. $\lim_{x\to 2} \dfrac{x^3 - 7x^2 + 10x}{x^2 + x - 6}$

$-\dfrac{6}{5}$

2. $\lim_{w\to -4} \dfrac{\sin(\pi w)}{w^2 - 16}$

$-\dfrac{\pi}{8}$

3. $\lim_{z\to 0} \dfrac{\sin(2z) + 7z^2 - 2z}{z^2(z+1)^2}$

7

4. $\lim_{x\to \pi} \dfrac{x-\pi}{\sin x}$

-1

5. $\lim_{x\to 3} \dfrac{x^2-9}{x+3}$

6

6. $\lim_{x\to 0} \dfrac{e^x - x - 1}{x^2}$

$\dfrac{1}{2}$

7. $\lim_{x\to 1} \dfrac{x-1}{\ln x}$

1

8. $\lim_{x\to 1} \dfrac{\sqrt{x} - \sqrt[3]{x}}{x-1}$

$\dfrac{1}{2}$

9. $\lim_{t\to \infty} \dfrac{\ln(3t)}{t^2}$

0

10. $\lim_{z\to \infty} \dfrac{z^2 + \mathbf{e}^{4z}}{2z - \mathbf{e}^{z}}$

$-\infty$

11. $\lim_{w\to 0^+} \left[w^2 \ln(4w^2)\right]$

0

12. $\lim_{x\to 1^+} \left[(x-1)\tan\left(\dfrac{\pi}{2}x\right)\right]$

$-\dfrac{2}{\pi}$