Additional Problems
Evaluate Limits
<mark>Differential Calculus</mark>
<mark>201-MA1-DW</mark>

Exercises: **Find the following limits, if exist.**

1. $\lim\limits_{x\to 3}\dfrac{x^2-x-6}{x^2+x-12}$

2. $\lim\limits_{x\to 2}\dfrac{x^2-x-2}{x^2+5x-14}$

3. $\lim\limits_{x\to 1}\dfrac{2x^2-x-1}{x^2+x-2}$

4. $\lim\limits_{x\to 3}\dfrac{x^2-9}{x^2+4x-21}$

5. $\lim\limits_{x\to -1}\dfrac{x^2+2x+1}{x^2+4x+3}$

6. $\lim\limits_{x\to 2}\dfrac{x^3-8}{x^2+2x-8}$

7. $\lim\limits_{x\to -2}\dfrac{x^2-4}{x^3+8}$

8. $\lim\limits_{x\to 1}\dfrac{x^3-x^2}{x^2+8x-9}$

9. $\lim\limits_{x\to 1}\dfrac{x^2-x-2}{x^2-6x-7}$

10. $\lim\limits_{x\to 2}\dfrac{3x^2-4x-4}{x^2-4}$

11. $\lim\limits_{x\to -2}\left\{\dfrac{2x^3-8x}{x+2}\right\}^2$

12. $\lim\limits_{x\to 0}\dfrac{\dfrac{1}{2+x}-\dfrac{1}{2}}{x}$

13. $\lim\limits_{x\to 0}\dfrac{\dfrac{1}{3+x}-\dfrac{1}{3}}{x}$

14. $\lim\limits_{x\to 1}\dfrac{\dfrac{x}{1+x}-\dfrac{1}{2}}{x-1}$

15. $\lim\limits_{x\to 2}\dfrac{\dfrac{x}{5+x}-\dfrac{2}{7}}{x-2}$

16. $\lim\limits_{x\to -3}\dfrac{x^2-9}{\dfrac{x}{x+8}+\dfrac{3}{5}}$

17. $\lim\limits_{x\to 3}\dfrac{20x-60}{x^3+4x^2-21x}$

18. $\lim\limits_{x\to -1}\dfrac{x+1}{x^3+3x^2+2x}$

Answers:

1. $\dfrac{5}{7}$ 2. $\dfrac{1}{3}$ 3. 1 4. $\dfrac{3}{5}$ 5. 0 6. 2 7. $-\dfrac{1}{3}$

8. $\dfrac{1}{10}$ 9. $\dfrac{1}{6}$ 10. 2 11. 256 12. $-\dfrac{1}{4}$ 13. $-\dfrac{1}{9}$ 14. $\dfrac{1}{4}$

15. $\dfrac{5}{49}$ 16. $-\dfrac{75}{4}$ 17. $\dfrac{2}{3}$ 18. -1

Exercises: **Find the following limits, if exists.**

19. $\lim\limits_{x\to 1}\dfrac{x-1}{\sqrt{x+3}-2}$

20. $\lim\limits_{x\to 2}\dfrac{x-2}{\sqrt{2x+5}-3}$

21. $\lim\limits_{x\to 4}\dfrac{x-4}{\sqrt{3x+4}-4}$

22. $\lim\limits_{x\to 2}\dfrac{\sqrt{5x+6}-4}{x-2}$

23. $\lim\limits_{x\to 7}\dfrac{\sqrt{3x+4}-5}{x-7}$

24. $\lim\limits_{x\to 2}\dfrac{\sqrt{2x}-2}{x-2}$

25. $\lim\limits_{x\to 2}\dfrac{x-2}{3-\sqrt{x^2+5}}$

26. $\lim\limits_{x\to 2}\dfrac{x-2}{4-\sqrt{3x^2+4}}$

27. $\lim\limits_{x\to 2}\dfrac{\sqrt{2x^3+9}-5}{x-2}$

Answers:

19. 4 20. 3 21. $\dfrac{8}{3}$ 22. $\dfrac{5}{8}$ 23. $\dfrac{3}{10}$ 24. $\dfrac{1}{2}$ 25. $-\dfrac{3}{2}$

26. $-\dfrac{2}{3}$ 27. $\dfrac{12}{5}$