20 Problems in Calculating Type 1 Difference Quotients
(Part 1)

$$\frac{f(x + h) - f(x)}{h}$$

PROBLEMS

1. $f(x) = x$

2. $f(x) = x^2$

3. $f(x) = x^3$

4. $f(x) = 2x^3$

5. $f(x) = 2x^2 + 5$

6. $-5x^2 + 3x$

7. $f(x) = x^3 - 2x^2 + 3$

8. $f(x) = 3x^2 - 5x + 4$

9. $f(x) = mx + b$

10. $f(x) = ax^2 + bx + c$

11. $f(x) = \frac{1}{x}$

12. $f(x) = \frac{1}{x+2}$

13. $f(x) = \frac{7}{x+2}$

14. $f(x) = \frac{7}{5x+2}$

15. $f(x) = \sqrt{x}$

16. $f(x) = \sqrt{x-3}$

17. $f(x) = \sqrt{x^2+1}$

18. $f(x) = \sqrt{3x^2+x}$

19. $f(x) = \frac{1}{\sqrt{x}}$

20. $f(x) = \frac{1}{\sqrt{x+2}}$

ANSWERS

1. 1	2. $2x+h$
3. $3x^2 + 3xh + h^2$	4. $6x^2 + 6xh + 2h^2$
5. $4x + 2h$	6. $-10x - 5h + 3$
7. $3x^2 + 3xh + h^2 - 4x - 2h$	8. $6x + 3h - 5$
9. m	10. $2ax + ah + b$
11. $\dfrac{-1}{x(x+h)}$	12. $\dfrac{-1}{(x+2)(x+h+2)}$
13. $\dfrac{-7}{(x+2)(x+h+2)}$	14. $\dfrac{-7}{(5x+2)(5(x+h)+2)}$
15. $\dfrac{1}{\sqrt{x+h}+\sqrt{x}}$	16. $\dfrac{1}{\sqrt{x+h-3}+\sqrt{x-3}}$
17. $\dfrac{2x+h}{\sqrt{(x+h)^2+1}+\sqrt{x^2+1}}$	18. $\dfrac{6x+3h+1}{\sqrt{3(x+h)^2+(x+h)}-\sqrt{3x^2+x}}$
19. $\dfrac{-1}{\sqrt{x}\sqrt{x+h}(\sqrt{x}+\sqrt{x+h})}$	20. $\dfrac{-1}{\sqrt{x+2}\sqrt{x+h+2}(\sqrt{x+2}+\sqrt{x+h+2})}$

"Only he who never plays, never loses."