More problems for section 2.10 of *Essentials of Precalculus with Calculus Previews* by Zill and Dewar, 6e.

1. For each function $f(x)$, find the difference quotient

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

and cancel the factor h from top and bottom.

a. $f(x) = 14 + 2x$	b. $f(x) = 5x + 2$	c. $f(x) = 2 - 3x$
d. $f(x) = 4x^2 - 5x + 6$	e. $f(x) = 2 + 3x - x^2$	f. $f(x) = 11$
g. $f(x) = x^3 + 3x$	h. $f(x) = 2x^3 - 4x + 1$	i. $f(x) = x^4 - x^2$
j. $f(x) = \dfrac{1}{x+2}$	k. $f(x) = \dfrac{1}{2x+3}$	l. $f(x) = \dfrac{2}{3-x}$
m. $f(x) = \dfrac{4-x}{3x}$	n. $f(x) = (x+1)^3 - 2$	o. $f(x) = (x+2)^2 - x^2$
p. $f(x) = 2 - (1-x)^3$	q. $f(x) = \dfrac{x+3}{x-7}$	r. $f(x) = \dfrac{4}{3x-1}$
s. $f(x) = \dfrac{2x}{7+3x}$	t. $f(x) = \sqrt{2x+1}$	u. $f(x) = 4 - \sqrt{2+x}$
v. $f(x) = 2 + \sqrt{3x+4}$	w. $f(x) = \sqrt{1-2x}$	x. $f(x) = -\sqrt{3-x}$

2. The instructions to Problem 1 above are the same as in part a of problems 11-26 in section 2.10 in our text. As an exercise, apply these same instructions to the functions found in problems 1-26 and 33-40.

<div align="center">Answers</div>

1a. 2   1b. 5   1c. -3 1d. $8x + 4h - 5$ 1e. $3 - 2x - h$ 1f. 0   1g. $3x^2 + 3xh + h^2 + 3$ 1h. $6x^2 + 6xh + 2h^2 - 4$ 1i. $4x^3 + 6x^2 h + 4xh^2 + h^3 - 2x - h$ 1j. $\frac{-1}{(x+2)(x+h+2)}$ 1k. $\frac{-2}{(2x+3)(2x+2h+3)}$ 1l. $\frac{2}{(3-x)(3-x-h)}$ 1m. $\frac{-4}{3x(x+h)}$ 1n. $3(x+1)^2 + 3(x+1)h + h^2$ 1o. 4   1p. $3x^2 + 3xh + h^2 - 6x - 3h + 3$ 1q. $\frac{-10}{(x-7)(x+h-7)}$ 1r. $\frac{-12}{(3x-1)(3x+3h-1)}$ 1s. $\frac{14}{(3x+7)(3x+3h+7)}$ 1t. $\frac{2}{\sqrt{2x+2h+1}+\sqrt{2x+1}}$ 1u. $\frac{-1}{\sqrt{2+x}+\sqrt{2+x+h}}$ 1v. $\frac{3}{\sqrt{3x+3h+4}+\sqrt{3x+4}}$ 1w. $\frac{-2}{\sqrt{1-2x-2h}+\sqrt{1-2x}}$ 1x. $\frac{1}{\sqrt{3-x-h}+\sqrt{3-x}}$

<div align="center">Difference quotients of the functions found in exercises in 2.10</div>

1. $2x + h$ 2. $-6x - 3h$ 3. $2x + h - 3$ 4. $-2x - h + 5$ 5. $-6x^2 - 6xh - 2h^2 + 1$ 6. $24x^2 + 24xh + 8h^2$ 7. $\frac{-1}{2x(x+h)}$ 8. $\frac{-4}{(x-1)(x+h-1)}$ 9. $(\sqrt{x} + \sqrt{x+h})^{-1}$ 10. $\frac{-1}{\sqrt{x}\sqrt{x+h}(\sqrt{x}+\sqrt{x+h})}$ 12. -3 14. $2x + h - 1$ 16. $4x + 2h + 1$ 18. $6x^2 + 6xh + 2h^2 + 2x + h$ 20. $\frac{-6}{(2x-4)(2x+2h-4)}$ 22. $\frac{7}{(x+5)(x+h+5)}$ 24. $\frac{-2x+h}{x^2(x+h)^2}$ 26. $\frac{2}{\sqrt{2x+1}+\sqrt{2x+2h+1}}$ 33. $6x + 3h$ 34. $2x + h - 8$ 35. $30x^2 + 30xh + 10h^2$ 36. $4x^3 + 6x^2 h + 4xh^2 + h^3$ 37. $\frac{-1}{x(x+h)}$ 38. $\frac{1}{x(x+h)}$ 39. $\frac{7}{\sqrt{7x}+\sqrt{7x+7h}}$ 40. $1/(\sqrt{x+9}\sqrt{x+h+9}(\sqrt{x+9}+\sqrt{x+h+9}))$