Name: Answer Key   **Date:** _____

1). Find the first 4 terms of the following sequence. (4 points)

$$f(n) = 2(x) + 4$$

$f(1) = 2(1) + 4 = 6$
$f(2) = 2(2) + 4 = 8$
$f(3) = 2(3) + 4 = 10$
$f(4) = 2(4) + 4 = 12$

2). Find the first 4 terms of the following sequence. (4 points)

$$f(n) = 5(x^2) - 7$$

$f(1) = 5(1)^2 - 7 = -2$
$f(2) = 5(2)^2 - 7 = 13$
$f(3) = 5(3)^2 - 7 = 38$
$f(4) = 5(4)^2 - 7 = 73$

3). Find the first 4 terms of the following sequence. (4 points)

$$f(n) = \frac{1}{2}(x) + 3$$

$f(1) = \frac{1}{2}(1) + 3 = \frac{1}{2} + 3 = \frac{1}{2} + \frac{6}{2} = \frac{7}{2}$
$f(2) = \frac{1}{2}(2) + 3 = 1 + 3 = 4$
$f(3) = \frac{1}{2}(3) + 3 = \frac{3}{2} + 3 = \frac{3}{2} + \frac{6}{2} = \frac{9}{2}$
$f(4) = \frac{1}{2}(4) + 3 = 2 + 3 = 5$

4). Find the first 6 terms of the following sequence. (6 points)

$$f(1) = 32, \qquad f(n) = f(n-1) + 6$$

$f(1) = 32$
$f(2) = 32 + 6 = 38$
$f(3) = 38 + 6 = 44$
$f(4) = 44 + 6 = 50$
$f(5) = 50 + 6 = 56$
$f(6) = 56 + 6 = 62$

5). Find the first 6 terms of the following sequence. (6 points)

$$f(1) = 100, \qquad f(n) = f(n-1) - 12$$

$f(1) = 100$
$f(2) = 100 - 12 = 88$
$f(3) = 88 - 12 = 76$
$f(4) = 76 - 12 = 64$
$f(5) = 64 - 12 = 52$
$f(6) = 52 - 12 = 40$

6). Find the first 6 terms of the following sequence. (6 points)

$$f(1) = 0, \qquad f(n) = f(n-1) + 17$$

$f(1) = 0$
$f(2) = 0 + 17 = 17$
$f(3) = 17 + 17 = 34$
$f(4) = 34 + 17 = 51$
$f(5) = 51 + 17 = 68$
$f(6) = 68 + 17 = 85$

Find the 20th term of the following sequences. (2 points)

7). $f(1) = 35, \; f(n) = f(n-1) + 5$

$f(1) = 35$ $\qquad$ $f(6) = 55 + 5 = 60$ $\qquad$ $f(11) = 80 + 5 = 85$ $\qquad$ $f(16) = 105 + 5 = 110$

$f(2) = 35 + 5 = 40$ $\qquad$ $f(7) = 60 + 5 = 65$ $\qquad$ $f(12) = 85 + 5 = 90$ $\qquad$ $f(17) = 110 + 5 = 115$

$f(3) = 40 + 5 = 45$ $\qquad$ $f(8) = 65 + 5 = 70$ $\qquad$ $f(13) = 90 + 5 = 95$ $\qquad$ $f(18) = 115 + 5 = 120$

$f(4) = 45 + 5 = 50$ $\qquad$ $f(9) = 70 + 5 = 75$ $\qquad$ $f(14) = 95 + 5 = 100$ $\qquad$ $f(19) = 120 + 5 = 125$

$f(5) = 60 + 5 = 55$ $\qquad$ $f(10) = 75 + 5 = 80$ $\qquad$ $f(15) = 100 + 5 = 105$ $\qquad$ $f(20) = 125 + 5 = 130$

8). $f(n) = 2(x) + 7$

$f(n) = 2(x) + 7$

$f(20) = 2(20) + 7$

$f(20) = 40 + 7$

$\boxed{f(20) = 47}$

$\boxed{130 \quad \text{is} \quad \text{the} \quad 20^{th} \text{ TERM}}$

Find what position the given number is in each sequence. (2 points)

9). $f(1) = 27, \quad f(n) = f(n-1) + 3; \quad 69$

$f(1) = 27$ $\qquad$ $f(7) = 42 + 3 = 45$ $\qquad$ $f(13) = 60 + 3 = 63$

$f(2) = 27 + 3 = 30$ $\qquad$ $f(8) = 45 + 3 = 48$ $\qquad$ $f(14) = 63 + 3 = 66$

$f(3) = 30 + 3 = 33$ $\qquad$ $f(9) = 48 + 3 = 51$ $\qquad$ $f(15) = 66 + 3 = 69$

$f(4) = 33 + 3 = 36$ $\qquad$ $f(10) = 51 + 3 = 54$

$f(5) = 36 + 3 = 39$ $\qquad$ $f(11) = 54 + 3 = 57$ $\qquad$ $\boxed{69 \quad \text{is} \quad \text{the} \quad 15^{th} \text{ Term}}$

$f(6) = 39 + 3 = 42$ $\qquad$ $f(12) = 57 + 3 = 60$

10). $f(n) = 2(x) + 7; \quad 77$

$77 = 2x + 7$
$-7 \qquad \quad -7$

$\dfrac{70}{2} = \dfrac{2x}{2}$

$35 = x$

$\boxed{35^{th} \quad \text{TERM} \quad \text{IS} \quad 77}$

For 11-12, Create an equation for the following situations and solve the question (6 points).

F	1	2	3	4	5
F(n)	12	24	36	48	60

General Recursive Rule

$f(1) \; f(n) = f(n-1) + d$

$F(1) = 12, \; d = 12$

$f(1) = 12, \; f(n) = f(n-1) + 12$

General Explicit Rule

$f(n) = f(1) + d(n-1)$

$f(1) = 12, \; d = 12$

$f(n) = 12 + 12(n-1)$

Use the General Explicit Rule to find f(24) $\longrightarrow$ $f(n) = 12 + 12(n-1)$

$$f(24) = 12 + 12(24-1)$$
$$f(24) = 12 + 12(23)$$
$$f(24) = 12 + 276$$
$$f(24) = 288$$

F	1	2	3	4	5
F(n)	7	18	29	40	51

General Recursive Rule

$f(1), f(n) = f(n-1) + d$
$$f(1) = 7, \quad d = 11$$
$$f(1) = 7, \quad f(n) = f(n-1) + 11$$

General Explicit Rule

$f(n) = f(1) + d(n-1)$
$$f(1) = 7, \quad d = 11$$
$$f(n) = 7 + 11(n-1)$$

Use the General Explicit Rule to find f(11)

$$f(n) = 7 + 11(n-1)$$
$$f(11) = 7 + 11(11-1)$$
$$f(11) = 7 + 11(10)$$
$$f(11) = 7 + 110$$
$$\boxed{f(11) = 117}$$

Solve the following equation for problems 13-15. (3 Points)

13). $3x + 5 = 38$
$$ -5 \quad -5$$
$$\frac{3x}{3} = \frac{33}{3}$$
$$\boxed{x = 11}$$

14). $\frac{1}{2}(x) - 5 = 25$
$$\phantom{\frac{1}{2}(x)} +5 \quad +5$$
$$\frac{1}{2}(x) = 30$$
$$2(\tfrac{1}{2}(x)) = 30(2)$$
$$\boxed{x = 60}$$

15). $2x - 0.5 = 25.5$
$$ +.5 \quad +.5$$
$$\frac{2x}{2} = \frac{26}{2}$$
$$\boxed{x = 13}$$