

Unit 3: Quadratic Functions Test Review

1. Determine the type of function (linear, quadratic, or exponential), the first difference (linear, constant or exponential) and write the recursive and explicit equations for the following.

a.

x	y
1	3
2	6
3	11
4	18
5	27

$\begin{matrix} > +3 \\ > +5 \\ > +7 \\ > +9 \end{matrix} \begin{matrix} > +2 \\ > +2 \\ > +2 \end{matrix}$

b.

x	y
1	4
2	9
3	16
4	25
5	36

$\begin{matrix} > +5 \\ > +7 \\ > +9 \\ > +11 \end{matrix} \begin{matrix} > 2 \\ > 2 \\ > 2 \end{matrix}$

c.

x	y
1	7
2	12
3	17
4	22
5	27

$\begin{matrix} > +5 \\ > +5 \\ > +5 \\ > +5 \end{matrix}$

Type: Quadratic

Type: Quadratic

Type: Linear

First difference: linear

First difference: linear

First difference: Constant

Recursive: $\begin{cases} f(1) = 3 \\ f(n) = f(n-1) + 2n - 1 \end{cases}$

Recursive: $\begin{cases} f(1) = 4 \\ f(n) = f(n-1) + 2n + 1 \end{cases}$

Recursive: $\begin{cases} f(1) = 7 \\ f(n) = f(n-1) + 5 \end{cases}$

Explicit: $y = x^2 + 2$

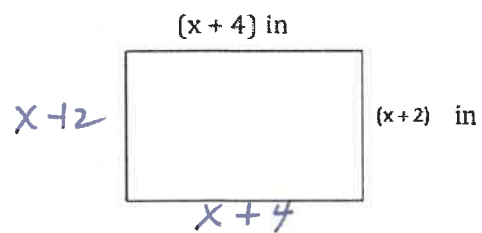
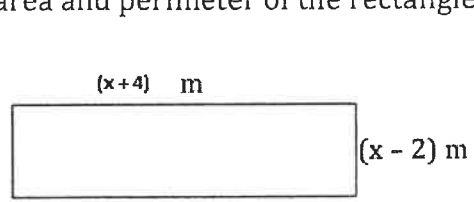
Explicit: $y = (x+1)^2$

Explicit: $y = 5x + 2$

check $18 = 11 + 2(4) - 1$
 $18 = 11 + 8 - 1$

check $25 = 16 + 2(4) + 1$

Find the area and perimeter of the rectangles.



a. Perimeter: $2(x+4) + 2(x-2)$
 $4x + 4$

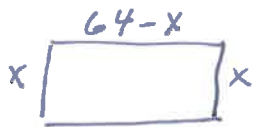
a. Perimeter: $4x + 12$

b. Area: $(x+4)(x-2)$
 $x^2 + 2x - 8$

b. Area: $x^2 + 6x + 8$

$(x+4)(x+2)$
 $x^2 + 2x + 4x + 8$

4. Find the largest possible area of a rectangular pen if you have 128 meters of fencing to build it.



$\frac{128 - 2x}{2}$

$y = 64x - x^2$
 (find maximum on cal. or use $x = -\frac{b}{2a}$)
 $y = -x^2 + 64x$

$A = x(64-x)$
 $A = 64x - x^2$

$4 \overline{) 128}$
 32

32×32

5. An object is launched from an 80 foot platform and its height is modeled by the equation $h(t) = -16t^2 + 64t + 80$.

- At what time was the object at its maximum height?
- What was the maximum height of the object?

2 seconds
144 feet

6. At a festival, stunt devils are launched in large catapults and air cannons. On one launch, the height of the stunt devil in feet above the ground after t seconds is modeled by $f(t) = -16t^2 + 100t + 15$. When did the stunt devil reach its maximum height?

time = 3.125 seconds

7. A volcano explodes, shooting lava into the air which is modeled by the equation, $h(t) = -16t^2 + 88t + 300$. What was the maximum height that the lava reached?

421 feet

8. The length of a pool is one more than three times the width, w . Which equation represents the total area, A , of the pool?

- A. $A = w^2 + w$ B. $A = 3w + 1$
 C. $A = w^2 + 3w$ D. $A = 3w^2 + w$



$A = w(3w+1)$
 $A = 3w^2 + w$

9. Jake has 26 yards of fencing to make a rectangular pen for his baby chicks. Which of the following dimensions of the pen can be built and give the baby chicks the most space?

- A. 12 yards by 1 yard $2x + 2 = 26$ $12(1) = 12$
 B. 10 yards by 3 yards $20 + 6 = 26$ $10(3) = 30$
 C. 8 yards by 7 yards $16 + 14 = 30$ NOPE - he only has 26 yds. of fencing
 D. 6 yards by 7 yards $12 + 14 = 26$ $6(7) = 42$:)

Simplify each of the following algebraic expressions by performing the indicated operation.

10. $(x + 5)(x + 2)$ $x \cdot x = x^2$
 $x \cdot 2 = 2x$
 $5 \cdot x = 5x$
 $5 \cdot 2 = 10$

$x^2 + 7x + 10$

11. $(x - 3)(2x + 5)$

$2x^2 - x - 15$

12. $3x(2x - 3)$

$6x^2 - 9x$

13. $x(50 - 25x) + 30$

$50x - 25x^2 + 30$

$-25x^2 + 50x + 30$

14. $(x^3 + 4x^2 - 3x + 2) + (2x^2 - 5)$

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

15. $(5x^2 + 2x - 19) - (x^2 - 4x + 13)$

$4x^2 + 6x - 32$

16. What is the greatest common factor of the following pairs?

a. $7x^2y^2$ and $28xy^3$

$(7x^2y^2)$ $(7 \cdot 2 \cdot 2xy^2)$

$7xy^2$
 $7xy^2$

b. $25ab^2c^3$ and $40a^2b^2c^2$

$(5 \cdot 5(a)(b)(b)(c)(c)(c))$ $(5 \cdot 2 \cdot 2 \cdot 2(a)(a)(b)(b)(c)(c))$

$5abc^2$
 $5abc^2$

#1, b	n	f(n)
	x	y
	1	4
	2	9
	3	16
	4	25
	5	36

+5
 +7
 +9
 +11
 +2
 +2
 +2

Recursive

$$\begin{cases} f(1) = 4 \\ f(n) = f(n-1) + 2n + \underline{\quad?} \end{cases}$$

$$16 = 9 + 2(3) + \underline{\quad}$$

$$16 = 9 + 6 + \underline{\quad}$$

$$16 = 15 + \underline{1}$$

$$\begin{aligned} f(1) &= 4 \\ f(n) &= f(n-1) + 2n + 1 \end{aligned}$$

check:

$$36 = 25 + 2(5) + 1$$

$$\begin{aligned} &25 + 10 \\ \checkmark &= 35 + 1 \end{aligned}$$