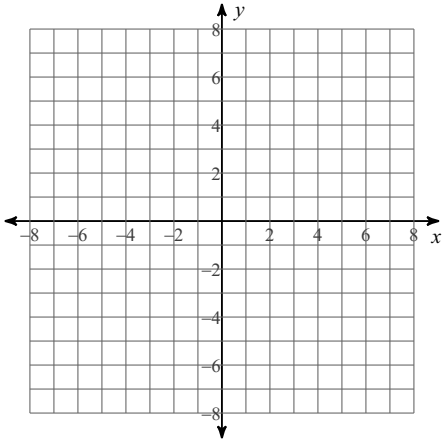
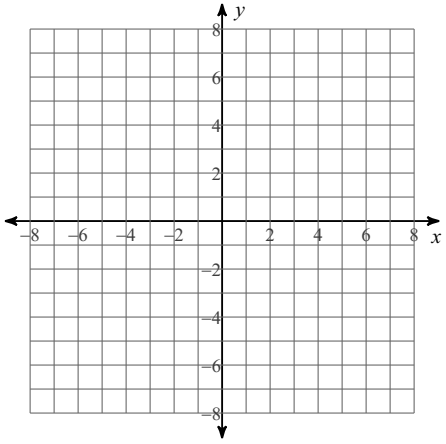
Quadratic Word Problems

Name_____

1) A parabola has a vertex at (3,-2) and passes through (6,7). Determine its equation in vertex form.



2) A parabola has a vertex at (-6,5) and passes through (-4,1). Determine its equation in vertex form.



3) A parabola has a vertex at (11,-4) and passes through (6,46). Determine its equation in vertex form.

4) A parabola has a vertex at (-8,-12) and has a y int of 20. Determine its equation in vertex form.

5) A parabola has a vertex at (17,23) and passes through (8,-4). Determine its equation in vertex form.

6) A parabola has x ints at (-4,0) and (10,0) and has a max value of 21. Determine its equation in vertex form.

7) A parabol shaped bowl is 20cm deep and has a 50cm diameter at its edge. Determine the parabola's a value.

8) A parabolic tunnel's arch is 12m above the ground and the bottom has a span of 30m. Determine the parabola's a value.

9) A rectangle has a length of $x + 8$ and a width of $10 - x$. Determine the x value that produces the maximum area and determine its maximum area. State the domain and range.

10) A rectangle has a length of $x + 12$ and a width of $8 - x$. Determine the x value that produces the maximum area and determine its maximum area. State the domain and range.

11) Jimmy throws a rock off a cliff. Its height over time is expressed by the equation $h = -5t^2 + 40t + 24$. Determine its maximum height, the time it takes to reach its maximum height, and the time it takes to hit the ground. State the domain and range.

12) Jimmy throws a rock off a cliff. Its height over time is expressed by the equation $h = -5t^2 + 15t + 13$. Determine its maximum height, the time it takes to reach its maximum height, and the time it takes to hit the ground. State the domain and range.

13) Determine the number of x ints for the function $y = (x + 3)^2 - 8$

14) Determine the number of x ints for the function $y = -3(x - 5)^2 - 2$

15) Determine the number of x ints for the function $y = -\frac{1}{4}(x + 290)^2$

16) Determine the number of x ints for the function $y = x^2 + 6x + 10$

17) Determine the number of x ints for the function $y = -3x^2 - 12x - 12$

18) Determine the number of x ints for the function $y = -\frac{1}{2}x^2 - 5x - 12$

19) Determine the number of x ints for the function $y = a(x - p)^2 + q$, if $a < 0$ and $q > 0$

20) Determine the number of x ints for the function $y = a(x - p)^2 + q$, if $a > 0$ and $q = 0$

21) Jimmy sells pizzas for $20 each and currently sells 80 per day. His market research tells him that for every $2 he increses the price, he will sell 4 fewer pizzas. Determine the price that will maximize his revenue and determine his maximum revenue. State the domain and range.

22) Jimmy sells shirts for $60 each and currently sells 210 per week. His market research tells him that for every $5 he decreses the price, he will sell 10 more shirts. Determine the price that will maximize his revenue and determine his maximum revenue. State the domain and range.

23) Jimmy is looking to build a rectangular enclosure for his pet Yaks. He has 200' of fencing and he will use the wall of his barn as one of the sides of the enclosure. Determine measurements of the other 3 sides that will maximimize the area of the enclosure and determine the maximum possible area for the enclosure.

Answers to Quadratic Word Problems

1) $y = (x-3)^2 - 2$ 2) $y = -(x+6)^2 + 5$ 3) $y = 2(x-11)^2 - 4$ 4) $y = \frac{1}{2}(x+8)^2 - 12$

5) $y = -\frac{1}{3}(x-17)^2 + 23$ 6) $y = -\frac{3}{7}(x-3)^2 + 21$ 7) $\frac{4}{125}$

8) $-\frac{4}{75}$

9) $x = 1$ area = 81 d: $\{-8 < x < 10\}$ r: $\{0 < A \le 81\}$

10) $x = -2$ area = 100 d: $\{-12 < x < 8\}$ r: $\{0 < A \le 100\}$

11) 104m at 4 s, 8.56s to hit the ground d: $\{0 \le t \le 8.56\}$ r: $\{0 \le h \le 104\}$

12) 24.25m at 1.5 s, 3.7s to hit the ground d: $\{0 \le t \le 3.7\}$ r: $\{0 \le h \le 24.25\}$

13) 2 14) 0 15) 1 16) 0

17) 1 18) 2 19) 2 20) 1

21) $n = 5$, \$30, \$1800 d: $\{-10 \le n \le 20\}$ r: $\{0 \le P \le 1800\}$

22) $n = -4.5$, \$82.50, \$13 612.50 d: $\{-21 \le n \le 12\}$ r: $\{0 \le P \le 13612.5\}$

23) length = 100', width = 50', max area = 5000 sq ft