Honors Math II

Unit 4 day 8

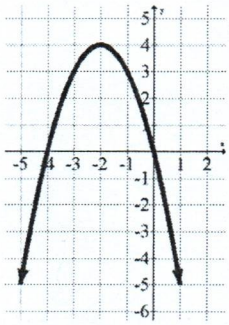
Name Key

Period_____ Date_____

Write the equations for the following parabolas in:

a) vertex form **b) intercept form** **c) standard form**

1.

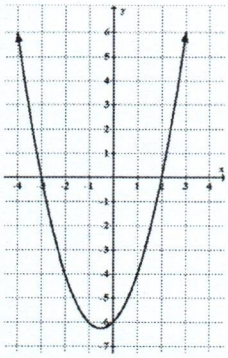


$y = -(x+2)^2 + 4$

$y = -x(x+4)$

$y = -x^2 - 4x$

2.

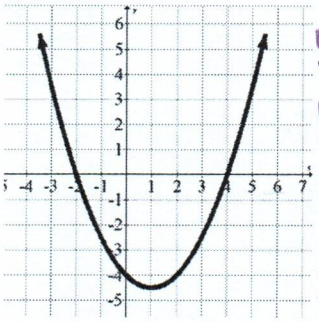


$y = (x + \frac{1}{2})^2 - 6.25$

$y = (x+3)(x-2)$

$y = x^2 + x - 6$

3.

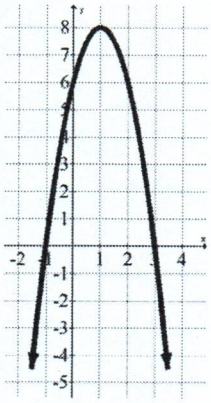


$y = \frac{1}{2}(x-1)^2 - 4.5$

$y = \frac{1}{2}(x+2)(x-4)$

$y = \frac{1}{2}x^2 - x - 4$

4.



$y = -2(x-1)^2 + 8$

$y = -2(x+1)(x-3)$

$y = -2x^2 + 4x + 6$

Write the equation for the quadratic function with the given information. show work to find "a"

5. vertex at (2, 7) and passes through (4, 2)

$y = -\frac{5}{4}(x-2)^2 + 7$

6. vertex at (−3, −2) and passes through (1, −10)

$y = -\frac{1}{2}(x+3)^2 - 2$

7. zeros at −3 and 2 and passes through the point (3, 12)

$y = 2(x+3)(x-2)$

8. zeros at −7, −3 and passes through the point (−1, 12)

$y = (x+7)(x+3)$

9. (−1, 0), (3, 0), (0, 6)

$y = -2(x+1)(x-3)$

10. (−4, 0), (2, 0), (0, −8)

$y = (x+4)(x-2)$

Solve 11-12 by completing the square.

11. $x^2 + 4x = 10$

$X = -2 \pm \sqrt{14}$

12. $2x^2 + 16x = -12$

$X = -4 \pm \sqrt{10}$

13. The path of a place kicked football can be modeled by the function: $f(x) = -.03x(x - 50)$

a) How far was the football kicked? 50 yds

b) What is the maximum height of the football? 18.75 yds

14. The height, h, in feet of an object above the ground is given by $h(t) = -16t^2 + 64t + 190$ where t is the time in seconds. Find the time it takes the object to strike the ground and find the maximum height of the object.

$t = 5.98$ sec hit ground

254 ft max height

15. A model rocket is launched from the roof of a building. Its flight path is modeled by $h(t) = -5t^2 + 30t + 10$ where h is the height of the rocket above the ground in meters and t is the time after the launch in seconds.
What is the rocket's maximum height? 55 meters

16. Ted popped a baseball straight up with an initial upwards velocity of 48ft/s. the height, h, in feet, of the ball above the ground is modeled by $h(t) = -16t^2 + 48t + 3$. How long was the ball in the air if the catcher catches the ball three feet above the ground? Is your answer reasonable to the situation? t= 3 seconds

17. The formula $h(t) = -16t^2 + 32t + 80$ gives the height, h, above the ground, in feet, of an object thrown, at $t = 0$, upward from the top of an 80 foot building.

a) What is the highest point reached by the object? 96 ft

b) How long does it take the object to reach its highest point? 1 sec

c) After how many seconds does the object hit the ground? 3.44 sec

show work for credit

Solve the following equations. Use any method.

18. $(x+4)^2 - 6 = 10$

$x = 0, -8$

19. $4(x+5)^2 - 2 = 46$

$x = -5 \pm 2\sqrt{3}$

20. $6x^2 + x - 5 = 0$

$x = 5/6, -1$

21. $-2x^2 - 8 = -16$

$x = \pm 2$

22. $3x^2 + 9x = 0$

$x = 0, -3$

23. $x^2 + 49 = 0$

$x = \pm 7i$

24. $2x^3 + 20x^2 + 48x = 0$

$x = 0, -6, -4$

25. $(x+6)^2 = 16$

$x = -2, -10$

Factor.

26. $x^3 - 4x$

$x(x+2)(x-2)$

27. $9x^2 + 16$

$(3x+4i)(3x-4i)$

28. $12x^2 - 4x$

$4x(3x-1)$

29. $-x^3 + x$

$-x(x^2-1)$

$-x(x+1)(x-1)$