Alg 2 Review Sec 5-2 to 5-4 Fall 2018

For each parabola in 1 to 6 do the following. You won't be able to use a graphing calculator on the quiz to do the graphing.

a) Find the equation of the Line of Symmetry
b) Find the coordinates of the vertex.
c) Find the y-intercept.
d) Graph the parabola using at least 5 points.

1. $y = 3x^2 - 8$
2. $y = x^2 + 2x - 8$
3. $y = -2x^2 - 12x - 10$
4. $y = (x-2)^2 - 3$
5. $y = -\frac{1}{2}(x+4)^2 + 5$
6. $y = 2(x+2)^2$

7. The following function models the additional expenses to a company when they hire employees. Where x represents the number of additional employee hires. $E(x) = 45x^2 - 360x + 4124$
   a) Find the number of additional employees to be hired that would minimize the company's expenses.
   b) Find the minimum additional expenses.

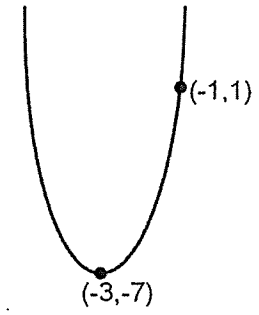
8. For each quadratic determine if it opens up or down.
   a) $y = -48x^2 + x + 89$
   b) $y = 0.75x^2 + 3x - 15$

9. For each quadratic determine if the vetex is a minimum or a maximum.
   a) $y = 9(x-7)^2 - 1$
   b) $y = -x^2 + 3x - 2$
   c) $0.015x^2 - 9x - 23$

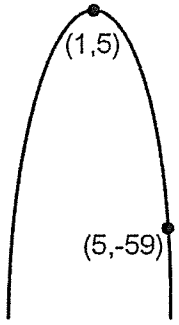
10. An object is shot into the air with initial velocity of 160ft/sec from the top of a 20 ft tall building. The following equation models the height of the object as a funciton of time. $h(t) = -16t^2 + 160t + 20$
    a) Find the maximum height of the object.
    b) Find the time it takes the object to reach max height.

11. Write the equation of each parabola in Vertex Form: $y = a(x-h)^2 + k$

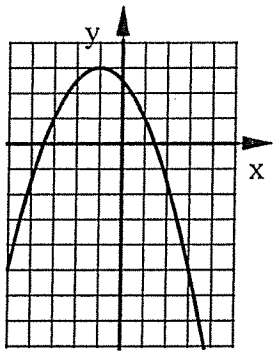
a)



b)



c)



d) The Vertex is $(-8, 13)$ and the y-intercept is 45.

12. The following equation models the profit (P) a company makes when it sells calculators at a certain price (c). $P(c) = -6.25(x-45)^2 + 3800$
    a) What is the company's profit if it charges \$60 per calculator?
    b) What is the maximum profit that company can expect when selling this calculator?
    c) What price should the company charge to earn the maximum profit?

Factor each completely.

13. $m^2 - 15m + 54$
14. $w^2 + 20w + 96$
15. $5c^2 - 40c + 35$
16. $7r^3 + 63r^2 + 98r$
17. $v^2 + 2v - 48$
18. $q^2 - 8q - 48$
19. $2n^2 - 2n - 40$
20. $11x^2 - 14x + 3$
21. $12x^2 - 80x - 28$
22. $8y^2 + 18y + 9$
23. $6z^2 + 7z - 10$
24. $m^2 - 225$
25. $66h^2 - 216$
26. $27a^2 - 192$
27. $8c^5 + 28c^3$
28. $18x^3 + 63x^2 - 128x - 448$
29. $3x^2 + 24x + 48$
30. $4x^3 - 48x^2 + 144x$
31. $9x^2 - 30x + 25$

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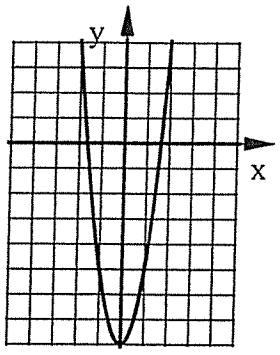
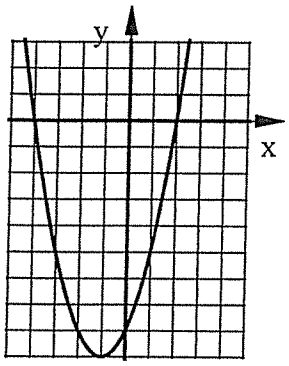
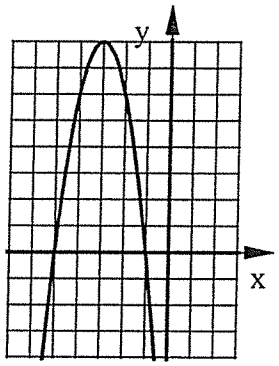
1. $y = 3x^2 - 8$
a) $LOS : x = 0$
b) $Vertex(0,-8)$
c) $y - int = -8$



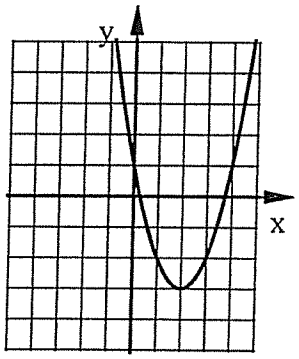
2. $y = x^2 + 2x - 8$
a) $LOS : x = -1$
b) $Vertex(-1,-9)$
c) $y - int = -8$



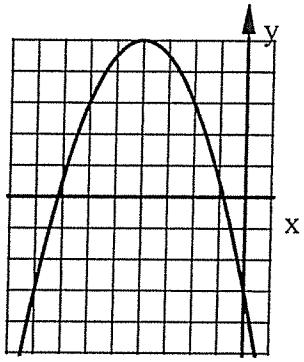
3. $y = -2x^2 - 12x - 10$
a) $LOS : x = -3$
b) $Vertex(-3,8)$
c) $y - int = -10$



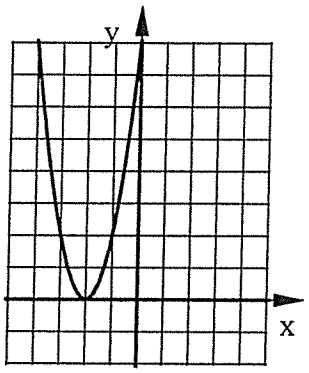
4. $y = (x-2)^2 - 3$
a) $LOS : x = 2$
b) $Vertex(2,-3)$
c) $y - int = 1$



5. $y = -\frac{1}{2}(x+4)^2 + 5$
a) $LOS : x = -4$
b) $Vertex(-4,5)$
c) $y - int = -3$



6. $y = 2(x+2)^2$
a) $LOS : x = -2$
b) $Vertex(-2,0)$
c) $y - int = 8$



7. a) #of additional exmployees hired = 4 b) Min expenses= \$3404 8. a) Down b) Up

9. a) Min b) Max c) Min 10. a) max ht = 420 ft b) time to reach max ht = 5 sec

11. a) $y = 2(x+3)^2 - 7$ b) $y = -4(x-1)^2 + 5$ c) $y = -\frac{1}{2}(x+1)^2 + 3$
d) $y = \frac{1}{2}(x+8)^2 + 13$

12. a) \$2393.80 b) \$3800 c) \$45 per calculator.

13. $(m-6)(m-9)$
14. $(w+12)(w+8)$
15. $5(c-1)(c-7)$
16. $7r(r+7)(r+2)$
17. $(v+8)(v-6)$
18. $(q+4)(q-12)$
19. $2(n+4)(n-5)$
20. $(11x-3)(x-1)$
21. $4(3x+1)(x-7)$
22. $(2y+3)(4y+3)$
23. $(z+2)(6z-5)$
24. $(m \pm 15)$
25. $6(11h^2 - 36)$
26. $3(3a \pm 8)$
27. $4c^3(2c^2 + 7)$
28. $(3x \pm 8)(2x+7)$
29. $3(x+4)^2$
30. $4x(x-6)^2$
31. $(3x-5)^2$