Change the equations to standard form.

9. $y = 2(x-1)^2 + 4$

$2(x^2-2x+1)+4$

$2x^2-4x+2+4$

$2x^2-4x+6$

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

$-(x^2+8x+16)-6$

$-x^2-8x-16-6$

$-x^2-8x-22$

Change the equations to vertex form.

11. $y = -3x^2 + 6x - 2$

$\frac{-6}{2(-3)} = \frac{-6}{-6} = 1$

$-3(1)^2+6(1)-2$

$-3+6-2$

$-5+6=1$

Vertex: (1, 1)

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

12. $y = 2x^2 + 8x + 1$

$\frac{-8}{2(2)} = \frac{-8}{4} = -2$

$2(-2)^2+8(-2)+1$

$2(4)-16+1$

$8-16+1 = -8+1 \rightarrow -7$

Vertex (-2, -7)

$y = 2(x+2)^2-7$

An object is projected into the air with a path described by the function $h(t) = -16t^2 + 96t + 160$ where h is the height above the ground in feet and t is the time in seconds since the object started along the path.

13. Find the time the object changes direction. 3 sec

14. Find the maximum height of the object. 304 ft.

15. Describe the location of the object at 2.5 seconds. up 300 ft

16. Describe the location of the object at 4.1 seconds. heading down → 284 ft.

Use the table of maximum load allowances for various heights of spruce columns.

17. Find a quadratic regression equation to model the max load given height.

18. Use your model to predict the maximum load allowed for an 8 ft. spruce column.

Maximum Load Allowance No. 1 Common Spruce	
Height of Column (ft)	Maximum Load (lb)
4	7280
5	7100
6	6650
7	5960

19. Compare the vertex, y-intercept, and rate of change from $x_1 = 1$ to $x_2 = 2$ for each of the following functions.

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

B.

X	Y
0	-26
1	-12
2	-2
3	4
4	6
5	4
6	-2

C.