Absolute Value and Quadratic Function Transformation Test Practice Problems

For 1-6, describe the transformation(s) and graph.

1.) \( f(x) = -3x^2 \)
2.) \( f(x) = |x + 3| - 3 \)
3.) \( f(x) = \frac{1}{2}|x - 2| \)

4.) \( f(x) = -(x - 1)^2 + 1 \)
5.) \( f(x) = 2|x| \)
6.) \( f(x) = 2x^2 - 3 \)

For 7-10, write a function \( g \) whose graph has the given transformations. Show all work.

7.) \( f(x) = 2x^2 + 4; \) translation down 12 units
8.) \( f(x) = (x + 3)^2 - 4; \) reflection over the vertex, translation 6 units right
9.) \( f(x) = \frac{3}{4}|x + 2| - 1; \) vertical stretch by a factor of 4
10.) \( f(x) = -|x - 3| - 1; \) reflected over the vertex, vertical shrink by \( \frac{1}{9} \)

For 11-14, give the information in the box. To find the equation, show any applicable work. Be sure to use interval notation.

11.)

Transformations: __________________
Equation: __________________
Domain: __________________
Range: __________________
Axis of symmetry: ______________
Intervals of increasing: __________
Intervals of decreasing: __________
Maximum: __________________
Minimum: __________________
12.) The graph below shows the height $h(t)$ in feet of a small rocket $t$ seconds after it is launched. The path of the rocket is given by the equation:

$$h(t) = -16t^2 + 128t.$$

a.) What is the vertex? What does it represent in this context?

b.) Using your knowledge of transformations of functions, write the equation for the parabola in vertex form.

c.) What is the interval where the function is increasing? What does this represent in the context of this question?

d.) What is the interval where the function is decreasing? What does this represent in the context of this question?

13.)

14.) The graph below shows the height $h(t)$ in feet of a small rocket $t$ seconds after it is launched. The path of the rocket is given by the equation: $h(t) = -16t^2 + 128t$.

a.) What is the vertex? What does it represent in this context?

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