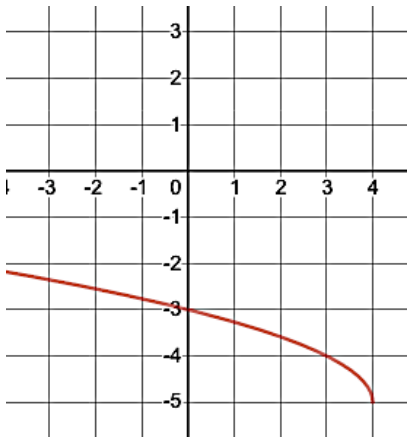


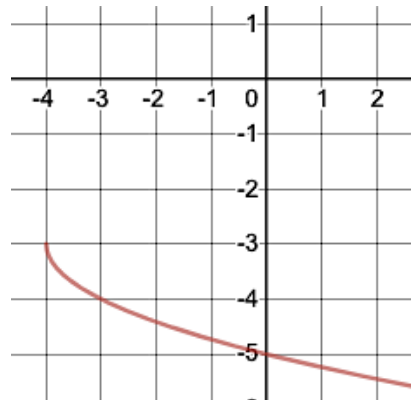
Square Root Functions Review

1. Sketch each of the following functions. (Label the vertex then sketch.)

a) $f(x) = \sqrt{-(x-4)} - 5$



b) $g(x) = -\sqrt{(x+2)} - 3$



2. Solve

a) $\sqrt{x-2} = 3$

$x = 11$

b) $2 - 3\sqrt{2-x} = 5$

no solution

c) $\sqrt{x+3} \geq 3$

$[6, \infty[$

d) $2\sqrt{x-7} + 5 = 0.2x + 8.4$

$x = 23$ and $x = 43$

3. Find the rule for the inverse of the following functions. Present answers in standard form $y = a(x-h)^2 + k$

a) $4\sqrt{-(x-1)} + 3$

$y = -\frac{1}{16}(x-3)^2 + 1$

b) $-2\sqrt{x+7} - 10$

$y = \frac{1}{4}(x+10)^2 - 7$

4. Find the rule of a square root function with a vertex of (2, 3) and that passes through point (5, -1). (Keep your 'a' in radical form)

$y = -\frac{4\sqrt{3}}{3}\sqrt{x-2} + 3$

5. A square root function has a range of $[4, +\infty[$ and is decreasing over its domain. What could be the rule of this function?

A) $f(x) = -\sqrt{x} + 4$

C) $h(x) = \sqrt{-x} + 4$

B) $g(x) = -\sqrt{(x-4)}$

D) $i(x) = \sqrt{-(x-4)}$

6. A missile is picked up by an airplane's radar. The path of the missile across the radar screen is represented by the following rule of correspondence:

$$A(s) = -10\sqrt{16(s - 3)} + 5000 \quad \text{where } A(s) \text{ represents the altitude in metres and } s, \text{ the time in seconds.}$$

Which statement is true?

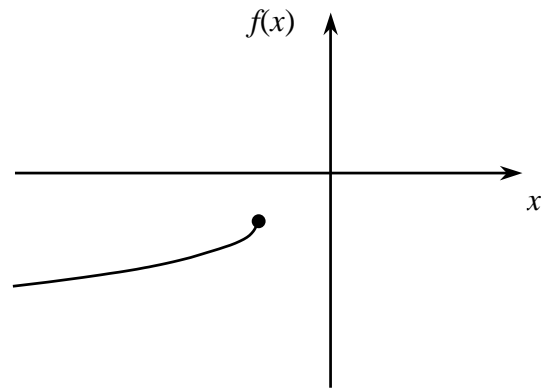
- A) The domain of the function is $[-3, +\infty[$.
- B) On the radar screen, the path of the missile is directed left.
- C) According to the rule of correspondence, the function is decreasing.
- D) According to the rule of correspondence, the function is increasing between 0 and 3

7. The graph of the function represented by the equation

$$f(x) = a\sqrt{b(x - h)} + k$$

is found in the third quadrant only. Which of the following is true?

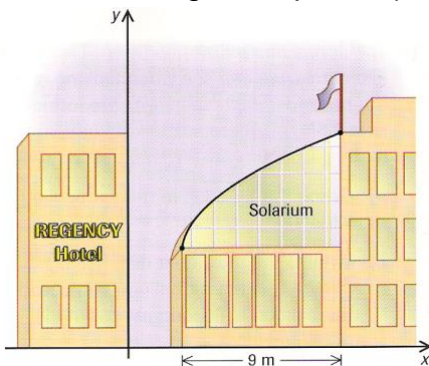
- A) $a > 0, b < 0, h < 0, k < 0$
- B) $a < 0, b < 0, h > 0, k < 0$
- C) $a < 0, b < 0, h < 0, k < 0$
- D) $a > 0, b > 0, h > 0, k < 0$



8. A hotel's dining room was moved into a large solarium whose roof is in the shape of a semi-parabola having the equation $y = \sqrt{4x - 20} + 6$. The solarium is 9m wide. This scenario is

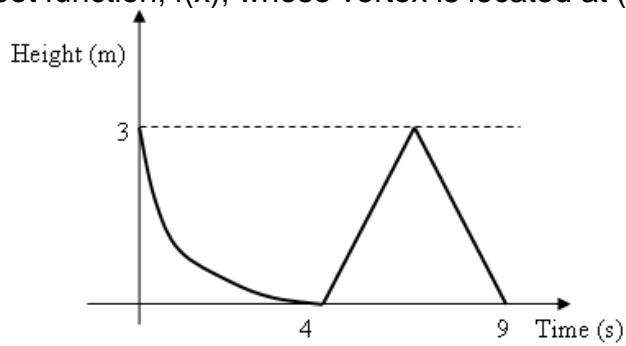
represented on the Cartesian plane below, whose axes are scaled in meters.

How far above the ground is the base of the flagpole?



12 m

9. Jonas is playing with his remote control plane. From 0 to 4 seconds, its path is that of a square root function, $f(x)$, whose vertex is located at $(0,3)$. From 4 to 9 seconds, the plane



follows the path of an absolute value function, $g(x)$. The following diagram shows the path of the plane over 9 seconds with respect to height, in meters.

What the value is of $(f \circ g)(6)$, rounded to the nearest tenth?

0.7m

- **10. A square root function in the form $y = a\sqrt{x-2} + k$ passes through points $(18,9)$ & $(66,17)$.

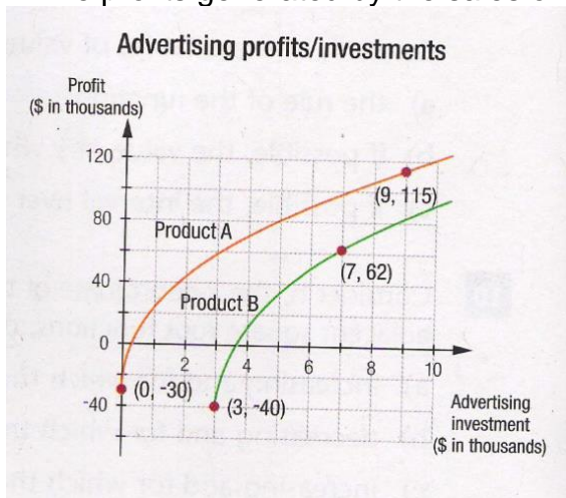
What is the value of x when $y = 8.5$?

$x = 16.0625$

11. Two helicopters searching for the survivors of a shipwreck travel side by side at an altitude of 300m. After receiving an order over their radios, one of the helicopters begins ascending such that its altitude, in meters, varies according to the equation $A_1(t) = 18t + 300$ where t is the time, in minutes, since the order was given. The second helicopter begins its ascent 4 minutes later and its altitude varies according to the rule $A_2(t) = 90\sqrt{t-4} + 300$. At what time will the helicopters be at the same altitude?

After 5 minutes and again after 20 minutes

12. The profits generated by the sales of two products of a company vary according to the amount invested in advertising. The graph below represents this situation.



The company wants to invest \$13,500 of advertising investments into one of the products. The company suggests that it is better to invest this money into product A. Is this true? Support your answer.

Product A: \$5585.83

Product B: \$5885.00

Product B is the better investment.