30b Orrison
Significance of the Derivative
Friday, September 18, 2015

11.{13, 15, 16, 17, 35}

11.13
Show that the sum of a positive number and it's reciprocal is at least 2.

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11.15
Two hallways, of widths a and b, meet at right angles (Figure 25). What is the greatest possible length of a ladder which can be carried horizontally around the corner?
(Note that you might want to see the figure in the book if you can't visualize this.)

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11.16
A garden is to be designed in the shape of a circular sector (Figure 26), with radius R and central angle θ. The garden is to have a fixed area A. For which value of R and θ (in radians) will the length of the fencing around the perimeter be minimized?

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11.17
A right angle is moved along the diameter of a circle of radius a, as shown in Figure 27. What is the greatest possible length $(A + B)$ intercepted on it by the circle?

■

11.35
Suppose that f and g are two differentiable functions which satisfy $fg' - f'g = 0$. Prove that if $f(a) = 0$ and $g(a) \neq 0$, then $f(x) = 0$ for all x in an interval around a. Hint: On any interval where f/g is defined, show that it is constant.

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