A2.A.40: Functional Notation: Write functions in functional notation

1 The equation $y - 2\sin\theta = 3$ may be rewritten as
1) $f(y) = 2\sin x + 3$
2) $f(y) = 2\sin\theta + 3$
3) $f(x) = 2\sin\theta + 3$
4) $f(\theta) = 2\sin\theta + 3$

2 A small, open-top packing box, similar to a shoebox without a lid, is three times as long as it is wide, and half as high as it is long. Each square inch of the bottom of the box costs \$0.008 to produce, while each square inch of any side costs \$0.003 to produce. Write a function for the cost of the box described above. Using this function, determine the dimensions of a box that would cost \$0.69 to produce.

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Answer Section

1 ANS: 4

$$y - 2\sin\theta = 3$$
$$y = 2\sin\theta + 3$$
$$f(\theta) = 2\sin\theta + 3$$

PTS: 2 REF: fall0927a2

2 ANS:

$f(w) = .06w^2$, $\sqrt{11.5} \times 3\sqrt{11.5} \times \frac{3}{2}\sqrt{11.5}$. The area of the bottom is $w \times 3w = 3w^2$, where w is the width in inches. If each square inch of the bottom costs \$0.008 to produce, the cost of the bottom may be expressed as $.024w^2$. The area of the two smaller sides is $2 \times w \times \frac{3}{2}w = 3w^2$ and the area of the two larger sides is $2 \times 3w \times \frac{3}{2}w = 9w^2$ for a total area of $12w^2$. If each square inch of a side of the box costs \$0.003 to produce, the cost of the bottom may be expressed as $.036w^2$. Adding the cost of the bottom and sides equals $.06w^2$. A function for the cost of the box is $f(w) = .06w^2$. A box that would cost \$0.69 to produce would have the following dimensions

$$.69 = .06w^2$$
$$w = \sqrt{11.5}$$
$$l = 3\sqrt{11.5}$$
$$h = \frac{3}{2}\sqrt{11.5}$$

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