Exercises - Recursive Formula

1

A sequence is recursively defined by
$a_n = \sqrt{(a_{n-1})^2 + 2}$. If $a_0 = \sqrt{2}$, what
is the value of a_2 ?

A) $\sqrt{5}$

B) $\sqrt{6}$

C) $\sqrt{8}$

D) 3

2

A sequence is recursively defined by
$a_{n+1} = a_n - \dfrac{f(a_n)}{g(a_n)}$. If $a_0 = 1$, $f(x) = x^2 - 3x$,
and $g(x) = 2x - 3$, what is the value of a_2 ?

A) -3

B) $-\dfrac{1}{5}$

C) 2

D) $\dfrac{3}{2}$

3

If $f(x) = \sqrt{2x^2 - 1}$, what is the value
of $f \circ f \circ f(2)$?

A) $\sqrt{10}$

B) $\sqrt{15}$

C) $\sqrt{21}$

D) 5

4

If A_0 is the initial amount deposited into a savings
account that earns at a fixed rate of r percent per
year, and a constant amount of $12b$ is added to
the account each year, then amount A_n of the
savings n years after the initial deposit is made

is given by the equation $A_n = (1 + \dfrac{r}{100}) \cdot A_{n-1} + 12b$.

What is A_3 , the amount you have in the savings
three years after you made the initial deposit, if
$r = 5$, $A_0 = 12,000$, and $b = 400$?

A) \$23,070.00

B) \$26,048.00

C) \$29,023.50

D) \$35,274.68

5

The number of gallons, P_n , of a pollutant in
a lake at the end of each month is given by the
recursively defined formula $P_n = 0.85P_{n-1} + 20$.
If the initial amount P_0 of a pollutant in the lake
is 400 gallons, what is P_3 , the amount of pollutant
in the lake at the end of the third month, to the
nearest gallon?

A) 297

B) 285

C) 273

D) 262