Name: HW 1.3 Key

1. The value of a fund grows according to the accumulation function $a(t) = 1 + 0.03t^2$. A deposit of P is made into the fund at time $t = 0$. The value of the fund at time $t = 4$ is 3000. Find P.

A) 2027.03 B) 1802.03 C) 1877.03 D) 1952.03 E) 2102.03

$Pa(4) = 3000$

$P(1.48) = 3000$

$P = \boxed{2027.03}$

2. The value of a fund grows according to the accumulation function $a(t) = (1 + 0.01t)^2$. A deposit of P is made into the fund at time $t = 0$. The fund is worth 3200 at time $t = 3$. Find the value of the fund at time $t = 6$.

A) 3389.12 B) 3104.44 C) 3199.33 D) 3294.23 E) 3484.02

$Pa(3) = 3200$

$P(1.0609) = 3200$

$P = 3016.3069$

$3016.3069\, a(6) = 3016.3069(1.1236) = \boxed{3389.12}$

3. The value of a fund grows according to the accumulation function $a(t) = (1 + 0.15t)^2$. A deposit of P is made into the fund at time $t = 0$. The fund is worth 2800 at time $t = 8$ and worth 5600 at time $t = n$. Find n.

A) 14.08 B) 13.29 C) 14.86 D) 15.65 E) 16.44

$Pa(8) = 2800 \rightarrow P(4.84) = 2800 \rightarrow 578.5124$

$578.5124\, a(n) = 5600$

$a(n) = 9.68$

$1 + 0.15n = 3.1113$

$n = \boxed{14.08}$

4. Roger borrows P from Sandra. He agrees to repay the loan with a single payment of Q at the end of 13 years. The loan accumulates compound interest at an annual effective interest rate of 6.6%. Roger owes an amount of 1267.21 at the end of year 5. Find Q.

A) 2113.03 B) 2011.61 C) 2062.32 D) 2163.75 E) 2214.46

$Q = 1267.21\,(1.066)^8 = \boxed{2113.03}$

5. Using the accumulation function $a(t) = 1 + 0.03t^2$, find the present value at time $t = 3$ of a payment of 3800 occurring at time $t = 7$.

A) 1953.8 B) 1844.4 C) 2063.3 D) 2172.7 E) 2282.1

$3800\,a(7 \to 3) = 3800\,\frac{a(3)}{a(7)} = 3800\,\frac{1.27}{2.47} = \boxed{1953.85}$