

**Radioactive Decay** In Exercises 33–40, complete the table for the radioactive isotope.

Isotope	Half-Life (in years)	Initial Quantity	Amount After 1,000 Years	Amount After 10,000 Years
33. $^{226}\text{Ra}$	1620	10g		
34. $^{226}\text{Ra}$	1620		1.5g	
35. $^{226}\text{Ra}$	1620			0.5g
36. $^{14}\text{C}$	5730			2g
37. $^{14}\text{C}$	5730	5g		
38. $^{14}\text{C}$	5730		3.2g	
39. $^{239}\text{Pu}$	24,360		2.1g	
40. $^{239}\text{Pu}$	24,360			0.4g

41. **Radioactive Decay** Radioactive radium has a half-life of approximately 1620 years. What percent of a given amount remains after 100 years?

42. **Carbon Dating** Carbon-14 dating assumes that the carbon dioxide on earth today has the same radioactive content as it did centuries ago. If this is true, the amount of  $^{14}\text{C}$  absorbed by a tree that grew several centuries ago should be the same as the amount of  $^{14}\text{C}$  absorbed by a tree growing today. A piece of ancient charcoal contains only 15% as much of the radioactive carbon as a piece of modern charcoal. How long ago was the tree burned to make the ancient charcoal? (The half-life of  $^{14}\text{C}$  is 5730 years.)

**Compound Interest** In Exercises 43–48, complete the table for a savings account in which interest is compounded continuously.

Initial Investment	Annual Rate	Time to Double	Amount After 10 Years
43. \$1000	6%		
44. \$20,000	5½%		
45. \$750		7½ yr	
46. \$10,000		5 yr	
47. \$500			\$1292.85
48. \$2000			\$5436.56

**Radioactive Decay** In Exercises 33–40, complete the table for the radioactive isotope.

Isotope	Half-Life (in years)	Initial Quantity	Amount After 1,000 Years	Amount After 10,000 Years
33. $^{226}\text{Ra}$	1620	10g		
34. $^{226}\text{Ra}$	1620		1.5g	
35. $^{226}\text{Ra}$	1620			0.5g
36. $^{14}\text{C}$	5730			2g
37. $^{14}\text{C}$	5730	5g		
38. $^{14}\text{C}$	5730		3.2g	
39. $^{239}\text{Pu}$	24,360		2.1g	
40. $^{239}\text{Pu}$	24,360			0.4g

41. **Radioactive Decay** Radioactive radium has a half-life of approximately 1620 years. What percent of a given amount remains after 100 years?

42. **Carbon Dating** Carbon-14 dating assumes that the carbon dioxide on earth today has the same radioactive content as it did centuries ago. If this is true, the amount of  $^{14}\text{C}$  absorbed by a tree that grew several centuries ago should be the same as the amount of  $^{14}\text{C}$  absorbed by a tree growing today. A piece of ancient charcoal contains only 15% as much of the radioactive carbon as a piece of modern charcoal. How long ago was the tree burned to make the ancient charcoal? (The half-life of  $^{14}\text{C}$  is 5730 years.)

**Compound Interest** In Exercises 43–48, complete the table for a savings account in which interest is compounded continuously.

Initial Investment	Annual Rate	Time to Double	Amount After 10 Years
43. \$1000	6%		
44. \$20,000	5½%		
45. \$750		7½ yr	
46. \$10,000		5 yr	
47. \$500			\$1292.85
48. \$2000			\$5436.56