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Quadratic and exponential word problems

1.A minor league hockey team has been collecting ticket sales data over the past year. At a current price of $25 per ticket, an average of 4000 seats are purchased. They predict that for each $1 increase in ticket price, 100 fewer tickets will be sold. Which of the following functions best models the amount of money that the hockey teams expect to collect from ticket sales, y, based on an $\$x$ increase in ticket price?

A. $y=(25+x)(4000-100x)$
B. $y=(25-x)(4000+100x)$
C. $y=x(4000-100x)$
D. $y=4000(25+x)$

2.A cable company with a reputation for poor customer service is losing subscribers at a rate of approximately 3% per year. The company had 2 million subscribers at the start of 2014. Assume that the company continues to lose subscribers at the same rate, and that there are no new subscribers. Which of the following functions, S, models the number of subscribers (in millions) remaining t years after the start of 2014?

A. $S(t)=2(1.03)t$
B. $S(t)=2(0.97)t$
C. $S(t)=2(0.70)t$
D. $S(t)=2(0.97)t$

3.Dalia tosses a ball to Kaylee. The ball travels along the path of a parabola and reaches a maximum height of 10ft above ground level after traveling a horizontal distance of 5ft. Let x represent the horizontal distance the ball has traveled, and let y represent the height of the ball above ground level. If Dalia releases the ball at an initial height of 3ft, which of the following functions models the path of the ball?

A. $y=3(x-5)2+10$

B. $y=-3(x-5)2+10$

C. $y=\frac{7}{25}(x-5)2+10$

D. $y=-\frac{7}{25}(x-5)2+10$

4.Tonya hits a golf ball from an initial height of 10 feet. The height of the golf ball, h, in feet above sea level, t seconds after the ball was hit, can be modeled by a quadratic function. If the golf ball reaches its maximum height of 74 feet exactly 2 seconds after it has been struck, which of the following functions best models the height of the golf ball?

A. $h(t)=10(t-2)2+74$
B. $h(t)=-10(t+2)2+74$
C. $h(t)=-16(t-2)2+74$
D. $h(t)=16(t+2)2+74$

5.Wang Lei would like to build a 144ft2 rectangular garden. He plans to enclose this area with exactly 50ft of fencing. Which of the following equations could be used to find the width, x, of Wang Lei's garden?

A. $x(72-x)=50$
B. $x(25-x)=144$
C. $x(144-2x)=50$
D. $x(50-2x)=144$

6.Under ideal conditions, Lemna minor (common duckweed) is a fast-growing fern that can double its area every 2 days. Assume the growth is unrestricted, and that the duckweed initially covers10 square centimeters (cm2) in area. Which of the following functions, F, models the area (in cm2) the duckweed covers after d days?

A. $F(d)=10\cdot(0.5)^{\frac{d}{2}}$
B. $F(d)=2\cdot 10d$
C. $F(d)=10\cdot 2d$
D. $F(d)=10\cdot 2^{\frac{d}{2}}$

7.Black tea is prepared by pouring boiling water (100°C) onto tea leaves and allowing the tea to brew in a pot or cup. In a room whose temperature is 20°C, the tea reaches a temperature of 60°C after about 4 minutes. The temperature of the tea as a function of time can be modeled by an exponential function. Which of the following functions, T, best models the temperature of the cup of tea t minutes after pouring boiling water onto the leaves?

A. $T(t)=20+80\cdot(0.84)t$
B. $T(t)=80+20\cdot(0.84)t$
C. $T(t)=80\cdot(0.84)t$
D. $T(t)=100\cdot(0.84)t$

8.Carbon-14 is a radioactive isotope used to determine the age of samples of organic matter. The amount of carbon-14 in a sample decreases once the organism is no longer alive. The half-life of carbon-14 is approximately 5730 years. This means that every 5730 years, the amount of carbon-14 in an organism that is no longer living will be halved. Which of the following functions, C, models the fraction of carbon-14 remaining in a sample after t years?

A. $C(t)=2^{\frac{t}{5730}}$

B. $C(t)=2^{-\frac{t}{5730}}$

C. $C(t)=2^{-5730t}$

D. $C(t)=2^{5730t}$

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Thanks

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