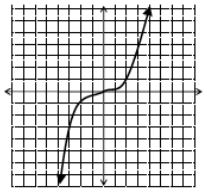
Polynomial Functions: Chapter 5

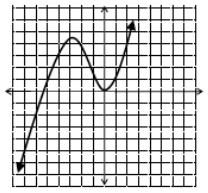
Practice Questions | **Notes**

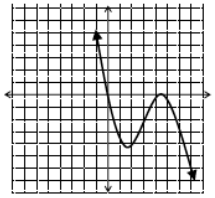
1. A student was given the following information about a function:

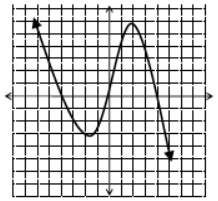
I.	It is cubic.
II.	It has a negative leading coefficient.
III.	It has one zero going through the point of origin.
IV.	It has one double zero.

Based on the criteria provided, which of the following graphs could represent the function described?

A) 

C) 

B) 

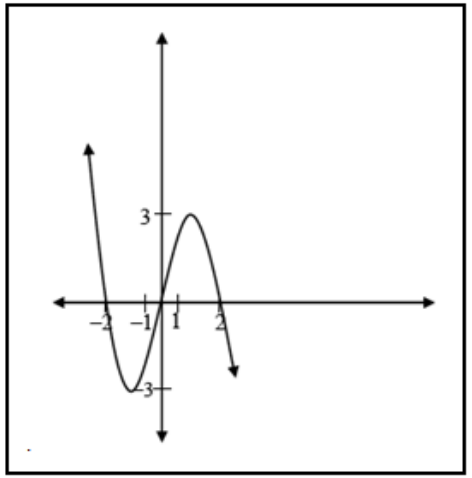
D) 

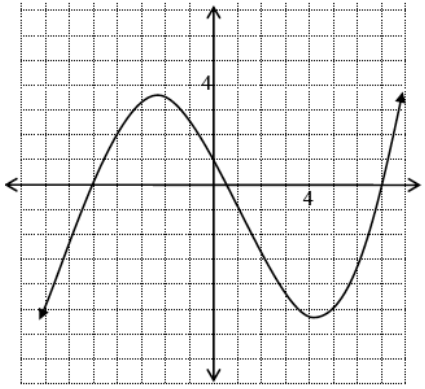
Notes: B

2. For the graph of which of the following functions would it be possible to have no x-intercepts?

A) $y = ax^3, a \neq 0$
B) $y = ax + b, a \neq 0$
C) $y = ax^2 + bx + c, a \neq 0$
D) $y = ax^3 + bx^2 + cx + d, a \neq 0$

Notes: C

3. State the roots for the function $f(x) = (x - 4)(2x - 7)(x + 1)$ A) $x = -1, x = \frac{7}{2}$ and $x = 4$ B) $x = 1, x = \frac{7}{2}$ and $x = 4$ C) $x = -1, x = -\frac{7}{2}$ and $x = 4$ D) $x = -1, x = \frac{7}{2}$ and $x = -4$	A
4. The partial graph of a third-degree polynomial function is shown  The domain of the function is: A) $x \in R$ B) $-2 \le x \le 2$ C) $-3 \le x \le 3$ D) $x \le -2, x \ge 2$	A

5. The graph of a function is shown.  The equation of the function could be: A) $p(x) = (x + 5)(2x - 1)(x - 7)$ B) $p(x) = \frac{1}{35}(x + 5)(2x - 1)(x - 7)$ C) $p(x) = (x - 5)(2x + 1)(x + 7)$ D) $p(x) = \frac{1}{35}(x - 5)(2x + 1)(x + 7)$	B
6. The motion of a motorized vehicle along a straight path is given by the function $m = t^3 - 24t^2 + 24t + 8$, where m is the displacement of the vehicle in millimeters and t is the time in seconds, $t \geq 0$. To the nearest tenth of a second, the second time the vehicle has a displacement of zero is _____.	22.9

7. *Use the following information to answer the question.*

A ball is launched vertically upward from a height of 5 ft, with an initial velocity of 96 ft/s. The height of the ball above the ground for the first 5 seconds is shown in the table below.

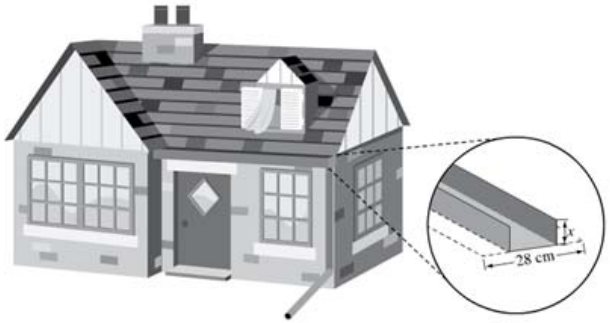
Time (s)	Height (ft)
0	5
1	86
2	134
3	150
4	134
5	86

These data could be **most appropriately** modelled using

A) Linear regression
B) Exponential Regression
C) Sinusoidal Regression
D) Quadratic Regression

D
Diagnostic : on

8. A rain gutter is made from sheets of aluminum that are 28 cm wide. The first step in forming the rain gutter is to turn the edges up to form right angles, as shown in the diagram below.



The cross sectional are formed by the turned up edges affects the water flow. This cross sectional area, *A*, can be modelled using the function

$A = x(28 - 2x)$

Where x is the height of the turned up edges.

To the nearest centimetre, the height of the turned up edge, x, that will maximize the cross-sectional area is _____ cm.

7

9. A hockey arena seats 1600 people. The cost of a ticket is $10. At this price, every ticketis sold. To obtain more revenue, the arena mangement plans to increase the ticket price. A survey was conducted to estimate the potential revenue for different ticket prices, as shown below.

Ticket Price ($)	Potential Revenue ($)
10	16 000
15	19 500
20	20 300
25	14 750
30	5 500

The data above can be modelled by a quadratic regression function of the form

$y = ax^2 + bx + c$

Where x is the ticket price, in dollars, and y is the potential revenue, in dollars.

Find the regression function that models this data.

Determine the ticket price that would maximize the revenue.

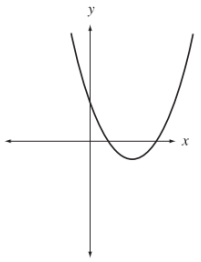
$y = -91x^2 + 3125x - 6340$

$17.17

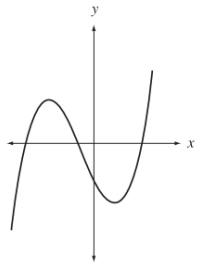
10.

Which of the following graphs is **most likely** the graph of a cubic function?

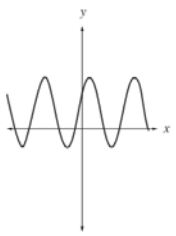
A.



B.



C.



D.

B

11.

The rate at which snow fell on a driveway on a particular day can be modelled by

$$y = -3x^2 + 6x$$

where y represents the rate of snowfall in cubic feet per hour, and x represents the time in hours.

To estimate the length of time that snow fell on this particular day, a student should determine the

A. y-intercept

B. x-coordinate of the vertex

C. y-coordinate of the vertex

D. difference between the x-intercepts

D.

12.

Water is being pumped into a 15-gallon tank. Once the volume of water in the tank reaches a certain amount, the tank begins to drain and continues draining until the water is completely gone. The volume of water in the tank can be modelled by the function

$$y = -2t^2 + 5t + 7$$

where y represents the volume of water in the tank in gallons and t represents the time in hours after noon on a particular day.

To determine the volume of water in the tank at noon, the characteristic of the graph of the function that should be analyzed is the

A. y-intercept

B. positive t-intercept

C. t-coordinate of the vertex

D. y-coordinate of the vertex

A

The maximum volume of water in the tank, to the nearest tenth of a gallon, is _____ gallons.

Which of the following rows describes the **most appropriate** domain and range of the function in this context?

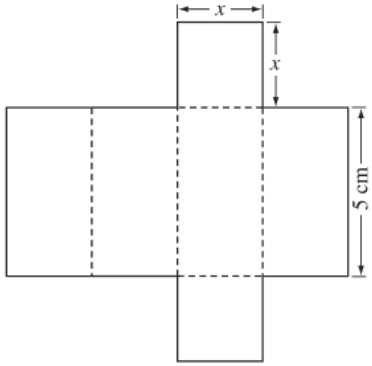
SE

Row	Domain	Range
A.	$t \in R$	$y \leq 10.125$
B.	$t \in R$	$0 \leq y \leq 10.125$
C.	$0 \leq t \leq 3.5$	$y \leq 10.125$
D.	$0 \leq t \leq 3.5$	$0 \leq y \leq 10.125$

D

13.

A rectangular cardboard box can be created by cutting out a pattern with the dimensions shown below and then folding the cardboard along the dotted lines.



The surface area and the volume of this box can be found using the formulas

Surface Area	$A = 2x^2 + 20x$
Volume	$V = 5x^2$

If the numerical values of the surface area and the volume of this cardboard box are the same, then the value of x, to the nearest tenth of a centimetre, is

A. 2.0 cm
B. 2.9 cm
C. 4.0 cm
D. 6.7 cm

D