

Part I

Answer all 24 questions in this part. Each correct answer will receive 2 credits. No partial credit will be allowed. Utilize the information provided for each question to determine your answer. Note that diagrams are not necessarily drawn to scale. For each statement or question, choose the word or expression that, of those given, best completes the statement or answers the question. Record your answers on your separate answer sheet. [48]

Use this space for computations.

1 The expression  $x^4 - 16$  is equivalent to

- (1)  $(x^2 + 8)(x^2 - 8)$       (3)  $(x^2 + 4)(x^2 - 4)$   
 (2)  $(x^2 - 8)(x^2 - 8)$       (4)  $(x^2 - 4)(x^2 - 4)$

} plug into  $y =$  in calculator and find which matches the table  
OR factor by DOPS!

2 An expression of the fifth degree is written with a leading coefficient of seven and a constant of six. Which expression is correctly written for these conditions? *no variables with 6*

- (1)  $6x^5 + x^4 + 7$       (3)  $6x^7 - x^5 + 5$   
 (2)  $7x^6 - 6x^4 + 5$       (4)  $7x^5 + 2x^2 + 6$

3 The table below shows the year and the number of households in a building that had high-speed broadband internet access.

<i>y</i>	Number of Households	11	16	23	33	42	47
<i>x</i>	Year	2002	2003	2004	2005	2006	2007

For which interval of time was the average rate of change the smallest?

- (1) 2002 - 2004      (3) 2004 - 2006  
 (2) 2003 - 2005      (4) 2005 - 2007

(1)  $\begin{array}{c|c} x & y \\ \hline 2002 & 11 \\ 2004 & 23 \end{array} \begin{array}{l} +2 \downarrow \\ \downarrow +12 \end{array}$

$\frac{12}{2} = 6$

(2)  $\begin{array}{c|c} x & y \\ \hline 2003 & 16 \\ 2005 & 33 \end{array} \begin{array}{l} +2 \downarrow \\ \downarrow +17 \end{array}$

$\frac{17}{2} = 8.5$

(3)  $\begin{array}{c|c} x & y \\ \hline 2004 & 23 \\ 2006 & 42 \end{array} \begin{array}{l} +2 \downarrow \\ \downarrow +19 \end{array}$

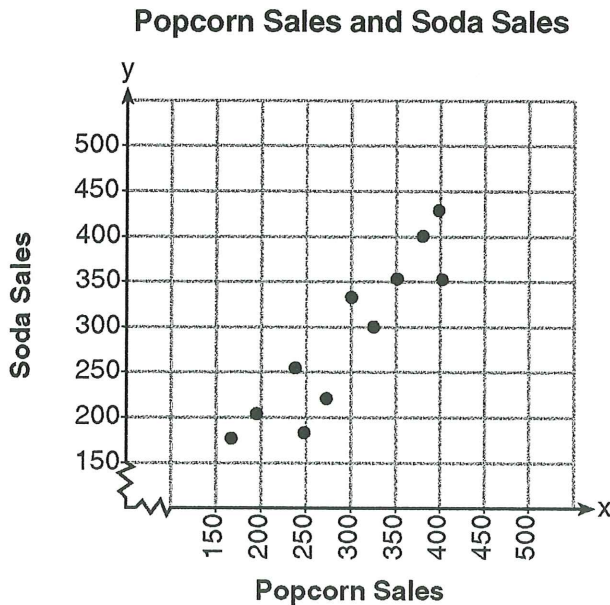
$\frac{19}{2} = 9.5$

(4)  $\begin{array}{c|c} x & y \\ \hline 2005 & 33 \\ 2007 & 47 \end{array} \begin{array}{l} +2 \downarrow \\ \downarrow +14 \end{array}$

$\frac{14}{2} = 7$

Use this space for computations.

- 4 The scatterplot below compares the number of bags of popcorn and the number of sodas sold at each performance of the circus over one week.



positive slope = positive correlation

Which conclusion can be drawn from the scatterplot?

- (1) There is a negative correlation between popcorn sales and soda sales.
- (2) There is a positive correlation between popcorn sales and soda sales.
- (3) There is no correlation between popcorn sales and soda sales.
- (4) Buying popcorn causes people to buy soda.

- 5 The Celluloid Cinema sold 150 tickets to a movie. Some of these were child tickets and the rest were adult tickets. A child ticket cost \$7.75 and an adult ticket cost \$10.25. If the cinema sold \$1470 worth of tickets, which system of equations could be used to determine how many adult tickets,  $a$ , and how many child tickets,  $c$ , were sold?

- (1)  $a + c = 150$   
 $10.25a + 7.75c = 1470$
- (2)  $a + c = 1470$   
 $10.25a + 7.75c = 150$
- (3)  $a + c = 150$   
 $7.75a + 10.25c = 1470$
- (4)  $a + c = 1470$   
 $7.75a + 10.25c = 150$

adult (a)	child (c)	Total
$10.25a$	$+ 7.75c$	$= 1470$
$a$	$+ c$	$= 150$

Use this space for computations.

6 The tables below show the values of four different functions for given values of  $x$ .

$x$	$f(x)$
1	12
2	19
3	26
4	33

$x$	$g(x)$
1	-1
2	1
3	5
4	13

$x$	$h(x)$
1	9
2	12
3	17
4	24

$x$	$k(x)$
1	-2
2	4
3	14
4	28

Which table represents a linear function?  $\rightarrow$  constant rate of change

(1)  $f(x)$

(2)  $g(x)$

(3)  $h(x)$

(4)  $k(x)$