Mathematics (Grades 5–12)

Subtest 1 Sample Items

1. If $x + 2y - xi + 6i = 5 + 7i$, what is $x - y$?

A. –9

B. –4

C. 2

D. 17

2. Three strategies for adding a column of one hundred integers are shown below:

1. Compute a sum for each set of five integers, then add all of the partial sums.
2. Sort the integers by size, then compute a sum for each subset of identical integers and add all of the partial sums.
3. Add each consecutive number to a running sum until all of the numbers have been added.

All three strategies are valid because the:

A. set of integers contains an additive inverse for each integer.

B. addition of integers distributes over multiplication.

C. set of integers is closed under the operation of addition.

D. addition of integers has associative and commutative properties.

3. Which of the following equations corresponds to the data in the table below?

x	y
−3	12
−2	6
−1	4
0	6
2	22

A. $y - 4 = 2(x + 1)^2$

B. $y - 4 = 2(x - 1)^2$

C. $y + 4 = 2(x - 1)^2$

D. $y + 4 = 2(x + 1)^2$

4. The entrance to a tunnel has the shape of an arch that is modeled by a quadratic equation with roots of –2 and 5 and a leading coefficient of –1. Approximately how high in feet is the tunnel entrance at its highest point?

A. 8 ft.

B. 12 ft.

C. 14 ft.

D. 17 ft.

5. Which of the following descriptions is represented by the slope of the tangent line ℓ in the graph below?
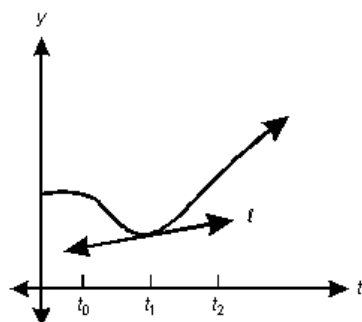
A. the average rate at which t is changing with respect to y between t_0 and t_2

B. the average rate at which y is changing with respect to t between t_0 and t_2

C. the instantaneous rate at which t is changing with respect to y at t_1

D. the instantaneous rate at which y is changing with respect to t at t_1

Answer Key

Item Number	Correct Response	Subarea	Objective
1	B	I. Number Sense	0001
2	D	I. Number Sense	0002
3	A	II. Functions, Algebra, and Calculus	0004
4	B	II. Functions, Algebra, and Calculus	0006
5	D	II. Functions, Algebra, and Calculus	0007

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