## HiSET.



- Get the HiSET® testing experience.
- Answer questions developed by the test maker.
- Find out if you're ready for the actual subtest.

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## Formula Sheet

## Perimeter / circumference

## Rectangle

Perimeter $=2($ length $)+2($ width $)$

## Circle

Circumference $=2 \pi$ (radius)
Area

## Circle

Area $=\pi(\text { radius })^{2}$

## Triangle

Area $=\frac{1}{2}$ (base)(height)

## Triangle

Circumference $=2 \pi$ (radius)

## Parallelogram

Area $=($ base $)($ height $)$
Trapezoid
Area $=\frac{1}{2}\left(\right.$ base $_{1}+$ base $\left._{2}\right)($ height $)$
Volume

## Prism/Cylinder

Volume $=($ area of the base $)($ height $)$

## Pyramid/Cone

Volume $=\frac{1}{3}$ (area of the base)(height)

## Sphere

Volume $=\frac{4}{3} \pi$ (radius)

Length
1 foot $=12$ inches
1 yard $=3$ feet
1 mile $=5,280$ feet
1 meter $=1,000$ millimeters
1 meter $=100$ centimeters
1 kilometer $=1,000$ meters
1 mile $\approx 1.6$ kilometers
1 inch $=2.54$ centimeters
1 foot $\approx 0.3$ meter
Capacity / Volume
1 cup $=8$ fluid ounces
1 pint $=2$ cups
1 quart $=2$ pints
1 gallon $=4$ quarts
1 liter $=1,000$ milliliters
1 liter $\approx 0.265$ gallon
Weight
1 pound $=16$ ounces
1 ton $=2,000$ pounds
1 gram $=1,000$ milligrams
1 kilogram $=1,000$ grams
1 kilogram $\approx 2.2$ pounds
1 ounce $\approx 28.3$ grams

## Mathematics

## Directions

## Time - 45 minutes <br> 25 Questions

This is a test of your skills in applying mathematical concepts and solving mathematical problems. Read each question carefully and decide which of the five options best answers the question. Then mark your choice on your answer sheet.

There are relatively easy problems scattered throughout the test. Thus, do not waste time on problems that are too difficult; go on, and return to them if you have time.

Work as quickly as you can without becoming careless. Try to answer every question even if you have to guess.
Mark all your answers on the answer sheet. Give only one answer to each question.
If you decide to change one of your answers, be sure to erase the first mark completely.
Be sure that the number of the question you are answering matches the number of the row of answer choices you are marking on your answer sheet. The answer sheet may contain more rows than you need.

Which of these is an irrational number?
A. $\sqrt{16 / 25}$
B. $\sqrt{17}$
C. $\sqrt{64}$
D. $\sqrt{169}$
E. $\sqrt{196}$

2

Which of the following expressions is equivalent to $\sqrt[3]{343 x^{9} y^{7}} ?$
A. $7 x^{3} y^{\frac{7}{3}}$
B. $7 x^{3} y^{2}$
C. $7 x^{6} y^{4}$
D. $7 \sqrt{7} x^{6} y^{4}$
E. $7 \sqrt{7} x^{3} y^{\frac{7}{3}}$

## 3

What is the scientific notation of the number 5,700,000,000?
A. $5.7 \times 10^{8}$
B. $5.7 \times 10^{9}$
C. $57 \times 10^{10}$
D. $0.57 \times 10^{9}$
E. $\quad 0.57 \times 10^{10}$

Oliver measures his sister's height as 57.3 inches using a measuring tape, marked with 5 divisions per inch. Given the level of accuracy of the measuring tape, which of the following could be Oliver's sister's actual height?
A. 57.03 in .
B. 57.23 in .
C. 57.32 in .
D. 57.003 in .
E. $\quad 57.031 \mathrm{in}$.

## 5

Which of these numbers is closest to the value of the expression $\frac{1}{6}+\frac{2}{5}$ ?
A. $\frac{2}{5}$
B. $\frac{3}{7}$
C. $\frac{3}{5}$
D. $\frac{5}{8}$
E. $\frac{2}{3}$

6

The coordinates of a triangle $P Q R$ are $P(1,2), Q(3$, $3)$, and $R(2,4)$. If triangle $P Q R$ is translated 2 units to the right and 1 unit down and then reflected across the $x$-axis to obtain triangle $X Y Z$, what are the coordinates of the vertices of triangle $X Y Z$ ?
A. $\quad X(1,3), Y(2,5)$, and $Z(3,4)$
B. $X(3,1), Y(5,2)$, and $Z(4,3)$
C. $X(3,-1), Y(5,-2)$, and $Z(4,-3)$
D. $X(-3,1), Y(-5,2)$, and $Z(-4,3)$
E. $X(-1,-3), Y(-2,-5)$, and $Z(-3,-4)$

7

The rectangle $P Q R S$ is as shown:


What is the length of the diagonal $P R$ of the rectangle?
A. $\sqrt{20}$ units
B. 52 units
C. 20 units
D. $\sqrt{52}$ units
E. 10 units

## 8

A tin container has a density of 7.2 grams per cubic centimeter and a volume of 180 cubic centimeters. What is the mass of the container in kilograms?
A. 0.025
B. 0.040
C. 1.296
D. 25
E. 1296

A cylindrical water storage container has a base radius of 0.5 m and a height of 1.4 m . If
1 cubic meter $=1,000$ liters, how many liters of water can the container store? Use $\pi=\frac{22}{7}$.
A. 1.1 liters
B. 2.2 liters
C. 110 liters
D. 220 liters
E. 1,100 liters

10

The histogram shows the age groups of students at a local dance academy.


Which statement is true about the students?
A. All the students are above 20 years.
B. All the students are below 35 years.
C. There are 25 students below 30 years.
D. There are 60 students below 30 years.
E. Most students are of the age group 30-35 years.

Which line would best fit the data shown in the scatter plot?
A.

B.

C.


D.


12

Sophia is playing a game in which she rolls a number cube numbered from 1 to 6 and flips a coin. What is the probability that the cube will land on 5 and the coin will land on tails?
A. $\frac{1}{12}$
B. $\frac{1}{6}$
C. $\frac{5}{12}$
D. $\frac{1}{2}$
E. $\frac{2}{3}$

13

There are four contenders for student council president. The table shows the number of votes each candidate received.

|  | Jorge | Omar | Scarlett | Grace | Total |
| :--- | :--- | :--- | :--- | :--- | :--- |
| Boys | 65 | 85 | 70 | 60 | 280 |
| Girls | 45 | 50 | 90 | 35 | 220 |
| Total | 110 | 135 | 160 | 95 | 500 |

Based on the table, which statement is true?
A. A higher percentage of girls voted for Omar.
B. A higher percentage of boys voted for Grace.
C. A higher percentage of girls voted for Jorge.
D. A higher percentage of boys voted for Jorge.
E. A higher percentage of girls voted for Scarlett.

What is the solution to $5 x^{2}-2 x+5=0$ ?
A. $x=\frac{1 \pm 2 i \sqrt{6}}{5}$
B. $x=\frac{-2 \pm 2 i \sqrt{6}}{10}$
C. $x=\frac{2 \pm 2 i \sqrt{6}}{5}$
D. $x=\frac{1 \pm 2 i \sqrt{6}}{10}$
E. $x=\frac{1 \pm 2 \sqrt{6}}{5}$

## 15

What is the solution of the equation $\sqrt{3 x+46}=$ $x+2$ ?
A. $\{-7\}$
B. $\{6\}$
C. $\{-6,7\}$
D. $\{-6,-7\}$
E. $\{-7,6\}$

## 16

Consider the system of equations:
$2 x-5 y=15$
$3 x-7 y=23$
What values of $x$ and $y$ represent the solution of the given system of equations?
A. $x=1$ and $y=10$
B. $x=\frac{25}{2}$ and $y=2$
C. $x=10$ and $y=1$
D. $x=5$ and $y=1$
E. $x=\frac{35}{4}$ and $y=\frac{1}{2}$

The total surface area $S$ of a right circular cone with radius $r$ and slant height $l$ is given by the equation $S=\pi r(r+l)$.

Which of the following equations correctly represents the slant height of the cone?
A. $l=S-\pi r^{2}$
B. $l=S-\pi r$
C. $l=\frac{S+\pi r^{2}}{\pi r}$
D. $l=\frac{S-\pi r^{2}}{\pi r}$
E. $l=\frac{\pi r^{2}-S}{\pi r}$

## 18

Oliver runs an apparel store. He employs three people and spends $\$ 210$ each day on their wages, in addition to $\$ 40$ on other daily expenses. The plastic bags they use cost $\$ 0.05$ each, and the number of bags used in a day is $x$. He models this situation using the equation $250+0.05 x$. What does $0.05 x$ represent?
A. Other daily expenses
B. Fixed daily expenses
C. Salary of each employee
D. Salary of the sales people
E. Cost of plastic bags used in a day

## 19

What is the product of the polynomials $-3 x^{2}+5$ and $x^{3}+3 x^{2}-x-7$ ?
A. $-3 x^{5}-9 x^{4}+8 x^{3}+6 x^{2}-5 x+35$
B. $-3 x^{5}-9 x^{4}+2 x^{3}+36 x^{2}-5 x-35$
C. $-3 x^{5}-9 x^{4}+8 x^{3}+6 x^{2}-5 x-35$
D. $-3 x^{5}-9 x^{4}+8 x^{3}+36 x^{2}-5 x-35$
E. $-3 x^{5}-9 x^{4}+2 x^{3}+36 x^{2}-5 x+35$

20

Which factorization can be used to reveal the zeros of the function $f(x)=2 x^{2}-3 x-2$ ?
A. $f(x)=(x+2)(2 x+1)$
B. $f(x)=(x-2)(2 x+1)$
C. $f(x)=(x-2)(2 x-1)$
D. $f(x)=(2 x+2)(x+1)$
E. $f(x)=(2 x-2)(x-1)$

## 21

What is the solution of the linear equation $-5(3-$ $7 x)=9 x+11 ?$
A. 1
B. $\frac{13}{22}$
C. $\frac{1}{11}$
D. $-\frac{2}{13}$
E. $-\frac{13}{22}$

## 22

The present value of a car is $\$ 37,000$. Its value depreciates by $15 \%$ every year. A person incorrectly wrote the inequality $37,000(0.15)^{n}<25,000$ to find the number of years $n$ after which the value of the car will be less than $\$ 25,000$. What change should be made to the inequality to correct it?
A. Replace 0.15 with 15 .
B. Replace 0.15 with 0.85 .
C. Replace $<$ with $>$.
D. Replace $(0.15)^{n}$ with $(0.15) n$.
E. Interchange 37,000 and 25,000 .

23
$\qquad$
Which table presents a function?

| $x$ | 1 | 3 | 1 | -1 |
| :--- | :--- | :--- | :--- | :--- |
| $f(x)$ | 2 | 4 | 3 | 0 |

A.

| $x$ | 0 | 2 | 5 | -3 |
| :--- | :--- | :--- | :--- | :--- |
| $f(x)$ | 1 | 4 | 6 | -7 |

B.

C.

| $x$ | 6 | -2 | 6 | -2 |
| :--- | :--- | :--- | :--- | :--- |
| $f(x)$ | 12 | -4 | 16 | -8 |

D.

| $x$ | 1 | 0 | 1 | -4 |
| :--- | :--- | :--- | :--- | :--- |
| $f(x)$ | 9 | 11 | 12 | 17 |

E.

24

Given $f(x)=2 x^{2}-3$, which statement is true about the average rate of change of the function?
A. The average rate of change of the function over the interval $[0,2]$ is 1.
B. The average rate of change of the function over the interval $[0,1]$ is -4 .
C. The average rate of change of the function over the interval $[1,2]$ is 6.
D. The average rate of change of the function over the interval $[2,3]$ is 20.
E. The average rate of change of the function over the interval $[3,4]$ is 17 .

A store is offering a discount of $\$ 5$ on a minimum purchase of $\$ 25$. A customer purchases $x$ identical coffee mugs worth $\$ 9$ each. The customer writes the equation $y=9 x-25$ to find the net amount $y$ in $\$$ to be paid by him.

Which of these statements is true?
A. The equation is incorrect because 25 should be replaced by 5 .
B. The equation is incorrect because - should be replaced by + .
C. The equation is incorrect because $9 x$ and 25 should be interchanged.
D. The equation is correct because the discount used by the customer on his purchase is $\$ 25$.
E. The equation is correct because $9 x$ represents the number of coffee mugs purchased by the customer.

## HiSET Answer Key and Rationales

| Sequence <br> Number | Correct <br> Response | Content Category | Question <br> Difficulty |
| :--- | :---: | :---: | :---: |
| 1 | B | I Numbers and Operations on Numbers | Easy |
| Rationale |  |  |  |
| Option B is correct because $\sqrt{17}$ cannot be expressed in the form $\frac{p}{q}$ for some integers $p$ and $q$ with $q \neq 0$. <br> So, it is an irrational number. $\sqrt{17}$ is a non-repeating, non-terminating decimal. |  |  |  |


| Sequence <br> Number | Correct <br> Response | Content Category | Question <br> Difficulty |
| :---: | :---: | :---: | :---: |
| $\mathbf{2}$ | A | I Numbers and Operations on Numbers | Medium |
| Rationale |  |  |  |
| Option A is correct because $\sqrt[3]{343 x^{9} y^{7}}=\left(343 x^{9} y^{7}\right)^{\frac{1}{3}}=7 x^{3} y^{\frac{7}{3}}$. |  |  |  |


| Sequence <br> Number | Correct <br> Response | Content Category | Question <br> Difficulty |
| :---: | :---: | :---: | :---: |
| 3 | B | I Numbers and Operations on Numbers | Easy |
| Rationale |  |  |  |
| Option B is correct because $5,700,000,000=57 \times 10^{8}=\frac{57}{10} \times 10^{8} \times 10=5.7 \times 10^{9}$. |  |  |  |


| Sequence <br> Number | Correct <br> Response | Content Category | Question <br> Difficulty |
| :---: | :---: | :---: | :---: |
| $\mathbf{4}$ | C | I Numbers and Operations on Numbers | Medium |
| Rationale |  |  |  |
| Option C is correct because Oliver measures his sister's height as 57.3 inches using a measuring tape, <br> marked with 5 divisions per inch. So, his sister's approximate height is 57.3 inches. Therefore, 57.32 inches <br> could be his sister's actual height. |  |  |  |


| Sequence <br> Number | Correct <br> Response | C | Content Category |
| :--- | :---: | :---: | :---: |
| 5 | Question <br> Difficulty |  |  |
| Rationale | Easy |  |  |
| Option C is correct because $\frac{1}{6}+\frac{2}{5}=\frac{5+12}{30}=\frac{17}{30} \approx 0.5667$. |  |  |  |
| Out of the given fractions, 0.5667 is closest to $\frac{3}{5}$. |  |  |  |


| Sequence <br> Number | Correct <br> Response | Content Category | Question <br> Difficulty |
| :--- | :---: | :---: | :---: |
| 6 | C | II Measurement / Geometry | Medium |
| Rationale |  |  |  |
| Option C is correct because a translation of 2 units to the right and 1 unit down of triangle $P Q R$ will result in <br> a triangle with vertices $(1+2,2-1),(3+2,3-1)$, and $(2+2,4-1)$, which are $(3,1),(5,2)$, and $(4,3)$. <br> Then, reflecting the resulting triangle across the $x$-axis will result in triangle $X Y Z$ with coordinates <br> $X(3,-1), Y(5,-2)$, and $Z(4,-3)$. |  |  |  |


| Sequence <br> Number | Correct <br> Response | Content Category | Question <br> Difficulty |
| :--- | :---: | :---: | :---: |
| 7 | II Measurement / Geometry | Medium |  |
| Rationale |  |  |  |
| Option D is correct because there are 4 vertical units between $P$ and $R$ and 6 horizontal units between $P$ <br> and $R$. Therefore, the distance between $P$ and $R$ is calculated using the Pythagorean Theorem, $(P R)^{2}=$ <br> $4^{2}+6^{2}$. Solving for $P R=\sqrt{4^{2}+6^{2}}=\sqrt{52}$ units. |  |  |  |


| Sequence <br> Number | Correct <br> Response | Content Category | Question <br> Difficulty |
| :--- | :---: | :---: | :---: |
| 8 | C | II Measurement / Geometry | Medium |
| Rationale |  |  |  |
| Option C is correct because density $=\frac{\text { mass }}{\text { volume } .}$ |  |  |  |
| $7.2=\frac{\text { mass }}{180}$ |  |  |  |
| $7.2(180)=$ mass |  |  |  |
| $1,296 \mathrm{~g}=$ mass |  |  |  |
| $1,296 \mathrm{~g} \div 1,000 \mathrm{~g}=1.296 \mathrm{~kg}$ |  |  |  |
| mass $=1296 \mathrm{~g}$ or 1.296 kg |  |  |  |


| Sequence <br> Number | Correct <br> Response | Content Category | Question <br> Difficulty |
| :--- | :---: | :---: | :---: |
| 9 | E | II Measurement / Geometry | Medium |
| Rationale |  |  |  |
| Option E is correct because the volume of the container $=\pi r^{2} h=\frac{22}{7} \times(0.5)^{2} \times 1.4=1.1 \mathrm{~m}^{3}$. <br> $1 \mathrm{~m}^{3}=1,000 L$ <br> $1.1 \mathrm{~m}^{3}=1,100$ liters |  |  |  |


| Sequence <br> Number | Correct <br> Response | Content Category | Question <br> Difficulty |
| :--- | :---: | :---: | :---: |
| $\mathbf{1 0}$ | D | III Data Analysis / Probability / Statistics | Medium |
| Rationale |  |  |  |
| Option D is correct because the number of students below 30 years equals the sum of the number of |  |  |  |
| students in the age groups $15-20,20-25$, and $25-30$, which is $15+25+20=60$. |  |  |  |


| Sequence <br> Number | Correct <br> Response | Content Category | Question <br> Difficulty |
| :--- | :---: | :---: | :---: |
| 11 | C | III Data Analysis / Probability / Statistics | Easy |
| Rationale |  |  |  |
| Option C is correct because its graph has the same number of points on, above, and below the line. |  |  |  |


| Sequence <br> Number | Correct <br> Response | Content Category | Question <br> Difficulty |
| :--- | :---: | :---: | :---: |
| 12 | A | III Data Analysis / Probability / Statistics | Easy |
| Rationale |  |  |  |
| Option A is correct. Since there are two events, the probability that the cube will land on 5 must be <br> multiplied by the probability that the coin will land on tails, $\frac{1}{6} \times \frac{1}{2}=\frac{1}{12}$. |  |  |  |


| Sequence <br> Number | Correct <br> Response | Content Category | Question <br> Difficulty |
| :--- | :---: | :---: | :---: |
| 13 | E | III Data Analysis / Probability / Statistics | Medium |
| Rationale |  |  |  |
| Option E is correct because the number of girls who voted for Scarlett is greater than the number of girls <br> who voted for any other candidate. So, the percentage of girls who voted for Scarlett at $90 / 220=40.9 \%$ will <br> be higher when compared to the other options. |  |  |  |


| Sequence <br> Number | Correct <br> Response | Content Category | Question <br> Difficulty |
| :--- | :---: | :---: | :---: |
| 14 | A III Data Analysis / Probability / Statistics | Hard |  |
| Rationale |  |  |  |
| Option A is correct because |  |  |  |
| $x=\frac{-(-2) \pm \sqrt{(-2)^{2}-4(5)(5)}}{2(5)}$ |  |  |  |
| $x=\frac{2 \pm \sqrt{4-100}}{10}$ |  |  |  |
| $x=\frac{2 \pm \sqrt{-96}}{10}$ |  |  |  |
| $x=\frac{2 \pm 4 i \sqrt{6}}{10}$ |  |  |  |
| $x=\frac{1 \pm 2 i \sqrt{6}}{5}$ |  |  |  |


| Sequence <br> Number | Correct <br> Response | Content Category | Question <br> Difficulty |
| :--- | :---: | :---: | :---: |
| 15 | B | Medium |  |
| Rationale | Mlgebraic Concepts |  |  |
| $\sqrt{3 x+46}=x+2$ |  |  |  |
| $3 x+46=(x+2)^{2}$ [By squaring on both sides] |  |  |  |
| $3 x+46=x^{2}+4 x+4$ |  |  |  |
| $x^{2}+x-42=0$ |  |  |  |
| $(x+7)(x-6)=0$ |  |  |  |
| $x=-7$ and $x=6$ |  |  |  |
| Substituting $x=-7$ in the given equation: $\sqrt{3 x+46}=x+2$ or $5 \neq-5$ |  |  |  |
| So $x=-7$ is the extraneous solution of the equation. |  |  |  |
| Substituting $x=6$ in the given equation: $\sqrt{3 x+46}=x+2$ or $8=8$ |  |  |  |
| So, $\{6\}$ is the solution set. |  |  |  |


| Sequence Number | Correct Response | Content Category | Question Difficulty |
| :---: | :---: | :---: | :---: |
| 16 | C | IV Algebraic Concepts | Medium |
| Rationale |  |  |  |
| Option C is correct because we solve the system of equations as shown: $\begin{aligned} & 2 x-5 y=15 \\ & 3 x-7 y=23 \end{aligned}$ <br> From $2 x-5 y=15$, we get $x=\frac{1}{2}(15+5 y)$ <br> By substituting $x=\frac{1}{2}(15+5 y)$ in $3 x-7 y=23$, we get $\begin{aligned} & 3\left(\frac{1}{2}(15+5 y)\right)-7 y=23 \\ & \frac{45}{2}+\frac{15}{2} y-7 y=23 \\ & \frac{1}{2} y=\frac{1}{2} \\ & y=1 \end{aligned}$ <br> Substituting $y=1$ in $x=\frac{1}{2}(15+5 y)$ we get $x=10$ <br> So, $x=10$ and $y=1$ represent the solution of the given system of equations. |  |  |  |
| Sequence Number | Correct <br> Response | Content Category | Question Difficulty |
| 17 | D | IV Algebraic Concepts | Hard |
| Rationale |  |  |  |
| Option D is correct because$\begin{aligned} & S=\pi r(r+l) \\ & S=\pi r^{2}+\pi r l \\ & \pi r l=S-\pi r^{2} \\ & l=\frac{S-\pi r^{2}}{\pi r} \end{aligned}$ |  |  |  |


| Sequence <br> Number | Correct <br> Response | Content Category | Question <br> Difficulty |
| :--- | :---: | :---: | :---: |
| 18 | IV Algebraic Concepts | Hard |  |
| Rationale |  |  |  |
| Option E is correct because <br> Cost of one plastic bag $=\$ 0.05$ <br> Number of plastic bags used in a day $=x$ <br> Cost of $x$ plastic bags $=\$ 0.05 x$ <br> Therefore, $0.05 x$ represents the cost of plastic bags used in a day. |  |  |  |


| Sequence <br> Number | Correct <br> Response | Content Category | Question <br> Difficulty |
| :---: | :---: | :---: | :---: |
| 19 | D | IV Algebraic Concepts | Medium |
| Rationale |  |  |  |
| Option D is correct because the product of the polynomials $-3 x^{2}+5$ and $x^{3}+3 x^{2}-x-7$ <br> $=-3 x^{5}-9 x^{4}+3 x^{3}+21 x^{2}+5 x^{3}+15 x^{2}-5 x-35$ <br> $=-3 x^{5}-9 x^{4}+8 x^{3}+36 x^{2}-5 x-35$ |  |  |  |


| Sequence <br> Number | Correct <br> Response | Content Category | Question <br> Difficulty |
| :--- | :---: | :---: | :---: |
| $\mathbf{2 0}$ | IV Algebraic Concepts | Medium |  |
| Rationale |  |  |  |
| Option B is correct because |  |  |  |
| $f(x)=2 x^{2}-3 x-2$ |  |  |  |
| $f(x)=2 x^{2}-4 x+x-2$ |  |  |  |
| $f(x)=2 x(x-2)+1(x-2)$ |  |  |  |
| $f(x)=(x-2)(2 x+1)$ |  |  |  |
| So, $f(x)=(x-2)(2 x+1)$ can be used to reveal the zeros of the function $f(x)=2 x^{2}-3 x-2$. |  |  |  |


| Sequence <br> Number | Correct <br> Response | Content Category | Question <br> Difficulty |
| :--- | :---: | :---: | :---: |
| 21 | A | IV Algebraic Concepts | Medium |
| Rationale |  |  |  |
| Option A is correct because |  |  |  |
| $-5(3-7 x)=9 x+11$ |  |  |  |
| $-15+35 x=9 x+11$ |  |  |  |
| $-15+35 x-9 x=11$ |  |  |  |
| $-15+26 x=11$ |  |  |  |
| $26 x=11+15$ |  |  |  |
| $26 x=26$ |  |  |  |
| $x=1$ |  |  |  |


| Sequence <br> Number | Correct <br> Response | Content Category | Question <br> Difficulty |
| :---: | :---: | :---: | :---: |
| 22 | B | IV Algebraic Concepts | Hard |
| Rationale |  |  |  |
| Option B is correct because the inequality must be <br> $37,000(1-0.15)^{n}<25,000,37,000(0.85)^{n}<25,000$. |  |  |  |


| Sequence <br> Number | Correct <br> Response | Content Category | Question <br> Difficulty |
| :---: | :---: | :---: | :---: |
| 23 | B | IV Algebraic Concepts | Easy |
| Rationale |  |  |  |
| Option B is correct because the function $f(x)$ assigns to each element of the domain exactly one element <br> of the range. |  |  |  |


| Sequence <br> Number | Correct <br> Response | Content Category | Question <br> Difficulty |
| :--- | :---: | :---: | :---: |
| 24 | C | IV Algebraic Concepts | Medium |
| Rationale |  |  |  |
| Option C is correct because average rate of change of the function over the interval $[1,2]$ is $\frac{f(2)-f(1)}{2-1}=$ <br> $\frac{5-(-1)}{1}=\frac{6}{1}=6$. |  |  |  |


| Sequence Number | Correct Response | Content Category | Question Difficulty |
| :---: | :---: | :---: | :---: |
| 25 | A | IV Algebraic Concepts | Medium |
| Rationale |  |  |  |
| Option A is correct because it is given that the customer purchased $x$ identical coffee mugs worth \$9 each |  |  |  |
| Cost of $x$ coffee mugs $=\$ 9 x$ |  |  |  |
| Discount used by the customer $=\$ 5$ |  |  |  |
| Net amount paid by the customer, $\$ y=9 x-5$. |  |  |  |
| Therefore, the equation written by the customer is incorrect and to correct it 25 should be replaced with 5 . |  |  |  |

