SAT-PSAT Handout: Writing and Reading

1 Clause

After the United Kingdom began rolling out taxes equivalent to a few cents on single-use plastic grocery bags in 2011, plastic-bag consumption decreased by up to ninety _____ taxes are subject to what economists call the "rebound effect": as the change became normalized, plastic-bag use started to creep back up.

Which choice completes the text so that it conforms to the conventions of Standard English?

A) percent, such
B) percent and such
C) percent. Such
D) percent such

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2 Apostrophe

Literary agents estimate that more than half of all nonfiction books credited to a celebrity or other public figure are in fact written by ghostwriters, professional authors who are paid to write other _____ but whose names never appear on book covers.

Which choice completes the text so that it conforms to the conventions of Standard English?

A) people's stories
B) peoples story's
C) peoples stories
D) people's story's

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3 Transitional Expression

Samuel Coleridge-Taylor was a prominent classical music composer from England who toured the US three times in the early 1900s. The child of a West African father and an English mother, Coleridge-Taylor emphasized his mixed-race ancestry. For example, he referred to himself as Anglo-African. _____ he incorporated the sounds of traditional African music into his classical music compositions.

Which choice completes the text with the most logical transition?

A) In addition,
B) Actually,
C) However,
D) Regardless,

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4 Word In Context

Anthropologist Kristian J. Carlson and colleagues examined the fossilized clavicle and shoulder bones of a 3.6-million-year-old early hominin known as "Little Foot." They found that these bones were _____ the clavicle and shoulder bones of modern apes that are frequent climbers, such as gorillas and chimpanzees, suggesting that Little Foot had adapted to life in the trees.

Which choice completes the text with the most logical and precise word or phrase?

A) surpassed by
B) comparable to
C) independent of
D) obtained from

Main Idea

The following text is adapted from Susan Glaspell's 1912 short story "'Out There.'" An elderly shop owner is looking at a picture that he recently acquired and hopes to sell.

> It did seem that the picture failed to fit in with the rest of the shop. A persuasive young fellow who claimed he was closing out his stock let the old man have it for what he called a song. It was only a little out-of-the-way store which subsisted chiefly on the framing of pictures. The old man looked around at his views of the city, his pictures of cats and dogs, his flaming bits of landscape. "Don't belong in here," he fumed.
>
> And yet the old man was secretly proud of his acquisition. There was a hidden dignity in his scowling as he shuffled about pondering the least ridiculous place for the picture.

Which choice best states the main purpose of the text?

A) To reveal the shop owner's conflicted feelings about the new picture

B) To convey the shop owner's resentment of the person he got the new picture from

C) To describe the items that the shop owner most highly prizes

D) To explain differences between the new picture and other pictures in the shop

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Underlined Purpose

The mimosa tree evolved in East Asia, where the beetle *Bruchidius terrenus* preys on its seeds. In 1785, mimosa trees were introduced to North America, far from any *B. terrenus*. But evolutionary links between predators and their prey can persist across centuries and continents. Around 2001, *B. terrenus* was introduced in southeastern North America near where botanist Shu-Mei Chang and colleagues had been monitoring mimosa trees. Within a year, 93 percent of the trees had been attacked by the beetles.

Which choice best describes the function of the third sentence in the overall structure of the text?

A) It states the hypothesis that Chang and colleagues had set out to investigate using mimosa trees and *B. terrenus*.

B) It presents a generalization that is exemplified by the discussion of the mimosa trees and *B. terrenus*.

C) It offers an alternative explanation for the findings of Chang and colleagues.

D) It provides context that clarifies why the species mentioned spread to new locations.

Student Notes

While researching a topic, a student has taken the following notes:

- Chemical leavening agents cause carbon dioxide to be released within a liquid batter, making the batter rise as it bakes.
- Baking soda and baking powder are chemical leavening agents.
- Baking soda is pure sodium bicarbonate.
- To produce carbon dioxide, baking soda needs to be mixed with liquid and an acidic ingredient such as honey.
- Baking powder is a mixture of sodium bicarbonate and an acid.
- To produce carbon dioxide, baking powder needs to be mixed with liquid but not with an acidic ingredient.

The student wants to emphasize a difference between baking soda and baking powder. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A) To make batters rise, bakers use chemical leavening agents such as baking soda and baking powder.

B) Baking soda and baking powder are chemical leavening agents that, when mixed with other ingredients, cause carbon dioxide to be released within a batter.

C) Baking soda is pure sodium bicarbonate, and honey is a type of acidic ingredient.

D) To produce carbon dioxide within a liquid batter, baking soda needs to be mixed with an acidic ingredient, whereas baking powder does not.

1: Ratios and Proportions (60 sec)

One serving of a certain brand of microwave popcorn provides 150 calories, 90 of which are from fat. One serving of a certain brand of low-sodium pretzels provides 120 calories, 12 of which are from fat. How many more calories from fat are provided by a 100-calorie serving of the microwave popcorn than are provided by a 100-calorie serving of the pretzels?

2: Exponents (60 sec)

$$2^{2/n}(\sqrt[n]{3})$$

If n is a positive integer, which of the following is the equivalent to the expression above?

A) $3^{\frac{1}{n}}$

B) $18^{\frac{1}{n}}$

C) $\sqrt[n]{6}$

D) $\sqrt[n]{12}$

3: Single Variables (90 sec)

The equation $9x + 5 = a(x + b)$, where a and b are constants, has no solutions. Which of the following must be true?

I. $a = 9$

II. $b = 5$

III. $b \neq \frac{5}{9}$

A) None

B) I only

C) I and II only

D) I and III only

4: System of Equations (75 sec)

$$4x + y = 7$$
$$2x - 7y = 1$$

If (x, y) is the solution to the given system of equations, what is the value of x ?

5: Functions (90 sec)

The function f is linear, $f(2) = 17$, and $f(8) = 19$. If $f(x) = mx + b$, where m and b are constants, what is the value of b ?

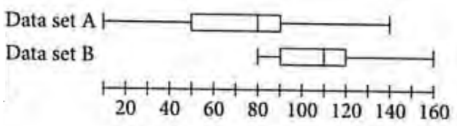
A) 11

B) 13

C) $\frac{49}{3}$

D) $\frac{55}{3}$

6: Statistics (75 sec)



Each of the box plots shown summarizes a data set. Data set A has a range of 130, and data set B has a range of 80. If the two data sets are combined into one data set, what is the range of the combined data set?

A) 50

B) 105

C) 150

D) 210

7: Circles (90 sec)

$$x^2 - 10x + y^2 + 6y = 2$$

The graph in the xy-plane of the equation above is a circle. What are the coordinates of the center of the circle?

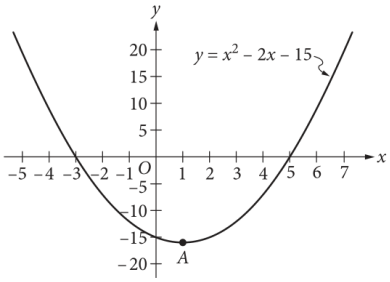
A) $(-5, -3)$

B) $(-5, 3)$

C) $(5, -3)$

D) $(5, 3)$

8: Parabolas (75 sec)



A) $y = (x + 3)(x - 5)$

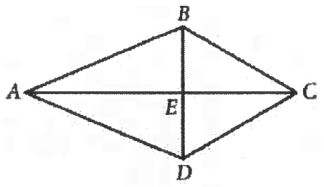
B) $y = (x - 3)(x + 5)$

C) $y = x(x - 2) - 15$

D) $y = (x - 1)^2 - 16$

Which of the following is an equivalent form of the equation of the graph shown in the xy-plane above, from which the coordinates of vertex A can be identified as constants in the equation?

9: Triangles (90 sec)



In the figure above, $AB = AD$, $BC = CD$, $BE = 2$, $BC = 4$, and $AC = 10$. What is the area of triangle ABD?

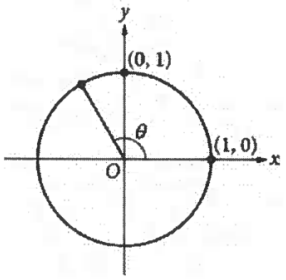
A) $40 - 8\sqrt{3}$

B) $30 - 6\sqrt{3}$

C) $20 - 4\sqrt{3}$

D) $10 - 2\sqrt{3}$

10: Trigonometry (75 sec)



In the given figure, θ is an angle. If $\sin\theta = \frac{\sqrt{3}}{2}$, what is $\cos\theta$?

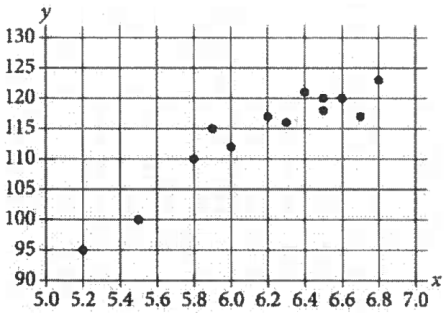
A) $\frac{\sqrt{3}}{2}$

B) $\frac{1}{2}$

C) $-\frac{1}{2}$

D) $-\frac{\sqrt{3}}{2}$

11: Graphs (90 sec)



A set of data is represented by the scatterplot in the portion of the xy-plane shown. Which of the given linear equations best fits the data?

A) $y = -15.2 + 1.6x$

B) $y = 15.2 + 1.6x$

C) $y = -15.2 + 16x$

D) $y = 15.2 + 16x$

PrepAccelerator's ACT® and SAT®-PSAT® Math Cheat Sheet

Algebra

exponents

$x^a x^b = x^{a+b}$ $\quad \frac{x^p}{x^q} = x^{p-q}$ $\quad (x^m)^n = x^{mn}$

$x^0 = 1$ $\quad x^1 = x$ $\quad x^{-m} = \frac{1}{x^m}$ $\quad x^{\frac{m}{n}} = \sqrt[n]{x^m}$

FOIL (First, Outer, Inner, Last)

$(a+b)(c+d) = ac + ad + bc + bd$

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quadratic formula

$ax^2 + bx + c = 0$ has the roots

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

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logarithms (ACT only)

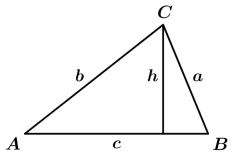
$\log_a x = u \Rightarrow x = a^u$ $\quad \log_a 1 = 0$ $\quad \log_a a = 1$

product rule $\quad \log_a xy = \log_a x + \log_a y$

quotient rule $\quad \log_a \left(\frac{x}{y}\right) = \log_a x - \log_a y$

power rule $\quad \log_a x^p = p \log_a x$

Plane Geometry

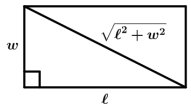


triangle

perimeter = $a + b + c$

area = $\frac{\text{base} \times \text{height}}{2} = \frac{ch}{2}$

area = $\frac{1}{2}ac \sin B$

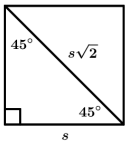


rectangle

perimeter = $2(\ell + w)$

area = ℓw

diagonal = $\sqrt{\ell^2 + w^2}$

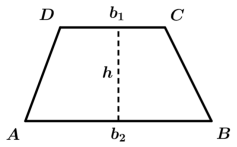


square

perimeter = $4s$

area = s^2

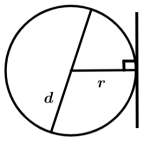
diagonal = $s\sqrt{2}$



trapezoid

area = base average × height

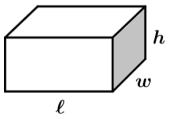
$= \left(\frac{b_1 + b_2}{2}\right)h$



circle

circumference = $2\pi r = \pi d$

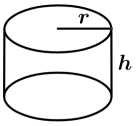
area = πr^2



rectangular prism or solid

area = $2(\ell w + \ell h + wh)$

volume = ℓwh



right circular cylinder

lateral area = $2\pi rh$

surface area = $2\pi rh + 2\pi r^2$

volume = $\pi r^2 h$

Coordinate Geometry

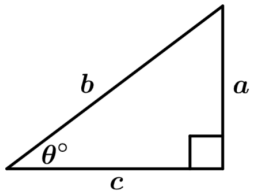
straight line

- slope = $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{\text{rise}}{\text{run}}$
- distance = $\sqrt{(y_2 - y_1)^2 + (x_2 - x_1)^2}$
- equation: $y = mx + b$

circle with center (h, k) and radius r has equation

$(x - h)^2 + (y - k)^2 = r^2$

Trigonometry

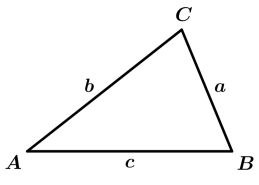


soh-cah-toa

$\sin\theta = \frac{\text{opp}}{\text{hyp}} = \frac{a}{b}$

$\cos\theta = \frac{\text{adj}}{\text{hyp}} = \frac{c}{b}$

$\tan\theta = \frac{\text{opp}}{\text{adj}} = \frac{a}{c}$



sine law (ACT only)

$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

cosine law (ACT only)

$c^2 = a^2 + b^2 - 2ab\cos C$

Pythagoras | correction