

Name: _____

Date: _____

Class Period: _____

SAT Unit 1 Assessment

Show or explain your reasoning on every problem. Use correct units, if necessary. Calculators are permitted on indicated problems.

SAT1.2 Simplify Expressions and Solve Equations	<p>1. <i>(non-calculator)</i> The sum of $-2x^2 + x + 31$ and $3x^2 + 7x - 8$ can be written in the form $ax^2 + bx + c$, where a, b, and c are constants. What is the value of $a + b + c$?</p>	<p>2. <i>(non-calculator)</i> If $\frac{2a}{b} = \frac{1}{2}$, what is the value of $\frac{b}{a}$? A) $\frac{1}{8}$ B) $\frac{1}{4}$ C) 2 D) 4</p>
	<p>3. <i>(non-calculator)</i> If $a^2 + b^2 = z$, and $ab = y$, which of the following is equivalent to $4z + 8y$? A) $(a + 2b)^2$ B) $(2a + 2b)^2$ C) $(4a + 4b)^2$ D) $(4a + 8b)^2$</p>	<p>4. <i>(non-calculator)</i> If $a = 5\sqrt{2}$ and $2a = \sqrt{2x}$, what is the value of x?</p>

SAT1.3 Linear Inequalities and Understanding Solutions	<p>5. <i>(calculator)</i> If $3p - 2 \geq 1$, what is the least possible value of $3p + 2$?</p> <p>A) 5 B) 3 C) 2 D) 1</p>	<p>6. <i>(calculator)</i> Which of the following numbers is not a solution to the inequality $6x - 9 \geq 7x - 5$?</p> <p>A) -8 B) -5 C) -4 D) -2</p>
	<p>7. <i>(non-calculator)</i> In the equation below, c is constant. If the equation has infinitely many solutions, what is the value of c?</p> $2(8 - 3x) + x = cx + 16$ <p>A) -7 B) -5 C) -3 D) -2</p>	<p>8. <i>(calculator)</i> If $\frac{5}{6} < \frac{1}{2}x - \frac{1}{2}y < \frac{3}{2}$, then what is one possible value for $x - y$?</p>

9. (*calculator*)

The cost of using a telephone in a hotel meeting room is \$0.20 per minute. Which of the following equations represents the total cost, c , in dollars, for h , hours of phone use?

- A) $c = 0.20(60h)$
 B) $c = 0.20h + 60$
 C) $c = \frac{60h}{0.20}$
 D) $c = \frac{0.20h}{60}$

10. (*non-calculator*)

A company that makes wildlife videos purchases camera equipment for \$32,400. The equipment depreciates in value at a constant rate for 12 years, after which it is considered to have no monetary value. How much is the camera equipment worth 4 years after it is purchased?

- A) \$10,800
 B) \$16,200
 C) \$21,600
 D) \$29,700

11. (*calculator*)

The number of customers at Sunshine Smoothies varies throughout the day. During the lunch rush on Saturday, there were 120 customers. The number of customers during dinnertime was 10 customers fewer than the number during breakfast. The number of customers during lunch was 3 times more than during breakfast. How many people were at Sunshine Smoothies during dinner?

12. (*calculator*)

$$S(P) = \frac{1}{2}P + 40$$

$$D(P) = 220 - P$$

The quantity of a product supplied and the quantity of the product demanded in an economic market are functions of the price of the product. The functions above are the estimated supply and demand functions for a certain product. The function $S(P)$ gives the quantity of the product supplied to the market when the price is P dollars, and the function $D(P)$ gives the quantity of the product demanded by the market when the price is P dollars.

At what price will the quantity of the product supplied to the market equal the quantity of the product demanded by the market?

- A) \$90
 B) \$120
 C) \$133
 D) \$155

13. (non-calculator)

The amount of money a small local business brings in on a given day, M , is modeled by the equation $M = 15B + 20E + 12$. Their daily expenses, C , are modeled by the equation $C = 3B - 10E + 4$. Find an expression for the store's daily profit, P , where $P = M - C$.

- A) $12B - 10E + 8$
 B) $18B + 30E + 16$
 C) $12B + 30E + 8$
 D) $18B + 10E + 16$

14. (non-calculator)

A bricklayer uses the formula $n = 7\ell h$ to estimate the number of bricks, n , need to build a wall that is ℓ feet long and h feet high. Which of the following correctly expresses ℓ in terms of n and h ?

- A) $\ell = \frac{7}{nh}$
 B) $\ell = \frac{h}{7n}$
 C) $\ell = \frac{n}{7h}$
 D) $\ell = \frac{n}{7+h}$

15. (calculator)

$$I = \frac{P}{4\pi r^2}$$

At a large distance r from a radio antenna, the intensity of the radio signal I is related to the power of the signal P by the formula above. Which of the following expresses the square of the distance from the radio antenna in terms of the intensity of the radio signal and the power of the signal?

- A) $r^2 = \frac{IP}{4\pi}$
 B) $r^2 = \frac{P}{4\pi I}$
 C) $r^2 = \frac{4\pi I}{P}$
 D) $r^2 = \frac{I}{4\pi P}$

16. (calculator)

Mosteller's formula: $A = \frac{\sqrt{hw}}{60}$

Current's formula: $A = \frac{4+w}{30}$

The formulas above are used in medicine to estimate the body surface area A , in square meters, of infants and children whose weight w ranges between 3 and 30 kilograms and whose height h is measured in centimeters. Based on Current's formula, what is w in terms of A ?

- A) $w = 30A - 4$
 B) $w = 30A + 4$
 C) $w = 30(A - 4)$
 D) $w = 30(A + 4)$