# SAT Formula Sheet Quiz (No Calculator)

1. If $m^2 + n^2 = x$ and $mn = y$, then which of the following is equivalent to $(m - n)^2 + (m + n)^2$?

   A) 0

   B) xy

   C) $2x$

   D) $x + y$

2. If $\sin(A) = \frac{7}{25}$ and $0° < A < 90°$, then what is the value of $\cos(90° - A)$?

   A) $\frac{7}{24}$

   B) $\frac{7}{25}$

   C) $\frac{24}{25}$

   D) $\frac{25}{7}$

3. An investment sustains 3% growth each year. If P represents the current value, which of the following expressions models the value of the investment t *months* from now?

   A) $P(1.03)^t$

   B) $P(1.03)^{\frac{t}{12}}$

   C) $P(1.03)^{12t}$

   D) $P(0.97)^{\frac{t}{12}}$

$$f(x) = 3x^2 + 6x - 24$$

4. Which of the following is an equivalent form of the above function from which the x-intercepts can be identified as constants or coefficients in the equation?

A) $f(x) = 3x^2 + 2(3x - 12)$

B) $f(x) = 3(x^2 + 2x - 8)$

C) $f(x) = 3(x + 1)^2 - 27$

D) $f(x) = 3(x - 2)(x + 4)$

30°
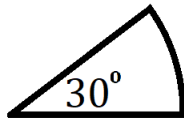
5. A circular pizza with a diameter of 14 inches is sliced into pieces such that each piece (as shown above) has an angle of 30° at the tip of the slice. What is the length, in inches, of the crust on each piece of pizza?

A) $\frac{7}{6}\pi$

B) $\frac{7}{3}\pi$

C) $\frac{49}{12}\pi$

D) 14π

6. Which of the following is equivalent to
$3x + i^{10} + (3x - i)(3x - i^3)$, where $i = \sqrt{-1}$?

A) $9x^2 + 3x$

B) $9x^2 + 3x + 2i$

C) $9x^2 + 3x + i - 1$

D) $9x^2 + 3x - i + 1$

7. Which of the following statements are true about the points $A(-3,7)$ and $B(2,-5)$?

>   I. The midpoint of the line segment between points A and B is $(-0.5 , 1)$.

>   II. The distance between points A and B is $\sqrt{5}$.

>   III. The distance between points A and B is 13.

>   IV. The slope of the line containing points A and B is $\frac{12}{5}$.

A) I and III only

B) I, II, and IV only

C) III and IV only

D) I, III, and IV only

$$\frac{2}{3}x + \frac{3}{5}y = 10$$

$$x + by = 15$$

8. In the system of linear equations above, b is a constant. If the system has infinitely many solutions, what is the value of b?

A) $\frac{9}{10}$

B) $\frac{2}{5}$

C) 3

D) 5

9. The graph of the equation $x^2 + y^2 - 6x + 4y = 13$ in the xy-plane is a circle. What are the coordinates of the center of the circle?

A) $(-6, 4)$

B) $(-3, 2)$

C) $(2, -3)$

D) $(3, -2)$

**BONUS QUESTION**: What is the radius of the circle?
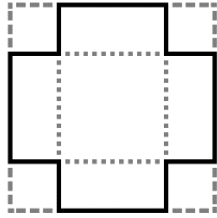
10. As pictured above, congruent squares of cardboard are removed from each corner of a square piece of cardboard and the sides are folded up to form an open box. The box is half as tall as it is wide and contains a volume of $13500\ cm^3$. What is the surface area of the open box?

A) $15\ cm$

B) $2700\ cm^2$

C) $3375\ cm^2$

D) $6750\ cm^2$

11. A manufacturer conducts a review of the efficacy of their production methods to develop and implement new strategies to more efficiently conduct quality control checks for defects. A random sample of their products analyzed over the course of a month was found to be statistically significant. The sample was 93% defect free with a 7% margin of error. Which of the following statements is the most reasonable conclusion from this analysis?

A) The actual percentage of defective products is likely between 0% and 14%.

B) Because 7% of the products are defective, the manufacturer should conduct quality control checks on 7% of the products.

C) Exactly 93% of the total products will be free from defects.

D) The manufacturer must conduct the review again during a different month in order to draw conclusions from the results.

12. Line l passes through the point $(5, 4)$ and is parallel to a line with the equation $2x - 5y = 10$. If line l also contains the point $(-5, b)$, what is the value of b?

    A) -10

    B) 0

    C) 5

    D) 10

Data Set A

Value	-3	-2	-1	0	1	2	3	4	5	6	7	8
Frequency	3	2	1	2	7	8	6	7	3	1	7	3

Data Set B
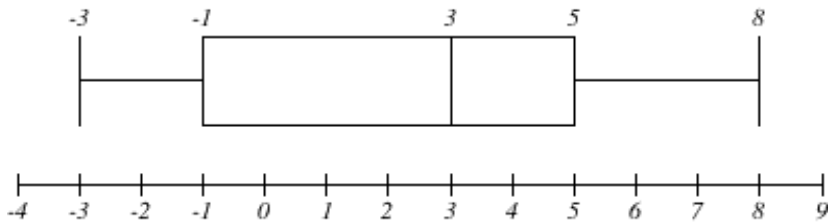
13. Data Set A contains 50 data points and is represented in the frequency table above. Data Set B is represented in the box plot above. Which of the following statements is true?

    A) The range of Data Set A is greater than the range of Data Set B.

    B) The median of Data Set A is equal to the median of Data Set B.

    C) The standard deviation of Data Set A is equal to the mean of Data Set B.

    D) Both data sets contain outliers.

$$\left(\left(x^{\frac{1}{3}}\right)\left(x^{-\frac{3}{4}}\right)\right)^{6}(x^{3})$$

14. Which of the following is equivalent to the above equation, for all $x > 0$?

A) $\sqrt{x}$

B) $x^{\frac{2}{3}}$

C) x^{12}

D) $\sqrt[4]{x^{3}}$

15. The variable y varies directly with x and inversely with the square of z. If $y = 10$ when $x = 5$ and $z = 2$, what is the value of y when $x = 40$ and $z = 4$?