

**HIGH SCHOOL ALGEBRA QUIZ CONTEST 2015
SAMPLE QUESTIONS**

- (1) The equation $x + 2y = 3|y| + 13$ is a linear equation (True or False). (**Answer: False**)
- (2) The set of real numbers $-2 \leq x < 3$ when written using interval notation is (**Answer: $[-2, 3)$**)
- (3) How many solutions does the equation

$$|5 + 3x| + 2 = 1$$

have? (**Answer: No Solution**)

- (4) What is the degree of the expression $5xy^2 + 3x^2y^2 - 8x^2y - 3x^2 + 8x - 15$? (**Answer: 4**)
- (5) What is the equation of the line passing through the points $(1, -1)$ and $(1, 2)$? (**Answer: $x = 1$**)
- (6) Factorize $(x + 1)^2 + (x + 1) - 2$. (**Answer: $x(x + 3)$**)
- (7) How many solutions does the system

$$\begin{aligned} 35x + 2y &= 5 \\ 2x - 35y &= 7 \end{aligned}$$

of linear equations have? (**Answer: One**)

- (8) Let a , b , and c are three real numbers such that $\frac{a}{b} = \frac{b}{c}$. Then
- (a) $2b = a + c$ (True or False). (**Answer: False**)
- (b) $\frac{a+b}{b} = \frac{b+c}{c}$ (True or False). (**Answer: True**)
- (9) What is the vertex of the parabola given by the equation $y = 3(x + 1)^2 - 2$? (**Answer: $(-1, -2)$**)
- (10) If x_1 and x_2 are zeros of the quadratic polynomial $2x^2 - 4x - 7$ then what is the value of the sum $x_1 + x_2$? (**Answer: 2**)
- (11) What is the domain of the function $f(x) = \frac{x + 3}{x^2 + 2x + 5}$? (**Answer: All real numbers**)
- (12) How many real solutions does the equation

$$\sqrt{3x - 2} + 3 = 2$$

have? (**Answer: No Solution**)

- (13) The volume V of a cylinder of radius r and height h is given by $V = \pi r^2 h$. What is the expression for r in terms of V and h ?

(Answer: $\sqrt{\frac{V}{\pi h}}$)

- (14) What are the values of x for which $x^{500} = x^{502}$? (Answer: 0, -1, and 1)

- (15) The rational expression $\frac{x}{2-x}$ is equivalent to

(a) $\frac{x}{x-2}$.

(b) $-\frac{x}{x-2}$.

(c) $-\frac{x}{2+x}$.

(d) $\frac{x}{-2-x}$.

(Answer: B)

- (16) John can finish a piece of work in four hours and his son can finish the same work in twelve hours. How long will they take to finish the work if they both work together? (Answer: 3 hours)

- (17) One of the roots of the quadratic equation $2x^2 - 12x + 15 = 0$ is $\frac{6 + \sqrt{6}}{2}$. What is the other root? (Answer: $\frac{6 - \sqrt{6}}{2}$)

- (18) The lines $x + 2y + 5 = 0$ and $y = 2x$ are

(a) parallel.

(b) perpendicular.

(c) neither parallel nor perpendicular.

(Answer: B)

- (19) What is the value of i^{100} ? (Answer: 1)

- (20) If $x+y = 0$, and $x \neq 0$ then what is the value of $\frac{x^{1931}}{y^{1931}}$? (Answer: -1)