

## Diagnostic Assessment

### Algebra 2

1. The solutions of the system of equations  $2x - 3y = 5$  and  $x = \frac{1}{4}$  is
- (a)  $\left(\frac{1}{4}, \frac{3}{2}\right)$
- (b)  $\left(-\frac{1}{4}, \frac{3}{2}\right)$
- (c)  $\left(\frac{1}{4}, -\frac{3}{2}\right)$
- (d)  $\left(-\frac{1}{4}, -\frac{3}{2}\right)$
2. If  $(2x - 3) \times (ax - 2b) = 6x^2 - 21x + 18$ , then  $a - b$  equals
- (a) 6
- (b) 0
- (c) 1
- (d) 4
3. If  $\frac{2x-3}{x+5} = \frac{5}{9}$ , then the value of  $x^2$  is
- (a) 4
- (b) 2
- (c)  $\pm 2$
- (d) 16
4.  $(x+1)$  is a factor of which of the following polynomials?
- (a)  $x^3 - 3x^2 - 2x + 4$
- (b)  $x^3 - 2x^2 + 3x + 4$
- (c)  $x^3 - 2x^2 - 3x + 4$
- (d)  $x^3 + 2x^2 - 3x - 4$
5. If  $x = |-3 + 8|$ ,  $y = | -(-3) - (+8) |$ ,  $z = | -(-8) + 3 |$ , then which of the following is true?
- (a)  $x=y=z$
- (b)  $z>x=y$
- (c)  $y>z>x$
- (d)  $x=z>y$
6. Which of the following statements describes the equation  $x + 8 = 3$  correctly?
- (a)  $x$  is 8 more than 3
- (b)  $x$  is 3 less than 8
- (c)  $x$  is 3 more than 8
- (d)  $x$  is 8 less than 3



7. If the point  $(a, b)$  lies on the line  $x = -3$  and  $(c, d)$  lies on the line  $y = -7$ , then  $a - d$  equals
- 10
  - 10
  - 4
  - 4
8. Which of the following system of equations has a unique solution?
- $$2x - 3y = 2$$

$$-2x + 3y = -2$$
  - $$3x - 2y = 1$$

$$2 + 4y = 6x$$
  - $$x - y = 2$$

$$2x + 4y = 3$$
  - $$x + 2y = -3$$

$$-x - 2y = -3$$
9.  $\sqrt{81x^4 p^{-2} y^2}$  equals
- $3x^2 py$
  - $9x^2 py$
  - $9x^2 p^{-1} y$
  - $3x^2 p^{-1} y$
10. If  $a = -3$ , and  $x = -2$ , then  $\frac{ax^2}{3} \div \frac{3x}{(-4a)}$  equals
- 8
  - $\frac{1}{8}$
  - 8
  - $-\frac{1}{8}$
11.  $\frac{5x - 15x^2}{-5x}$  equals
- $1 - 5x$
  - $3x - 1$
  - $1 - 3x$
  - $5x - 1$
12.  $\sqrt{16x^4 y^2} + \sqrt[3]{27x^6 y^3}$  equals
- $7xy^2$
  - $7x^2 y^2$
  - $7x^2 y$
  - $7xy$



13. If  $A = \frac{3x}{2} - \frac{4x-1}{4}$ ,  $B = \frac{x}{5} \div 2$ , then

(a)  $A > B$  for  $x = 2$

(b)  $A < B$  for  $x = \frac{1}{2}$

(c)  $A < B$  for  $x = -\frac{1}{2}$

(d)  $A < B$  for  $x = 3$

14. Which of the following equals  $10x^2$  ?

(a)  $5x + 5x$

(b)  $5x + 5x^2$

(c)  $5x \times 5x$

(d) None of the above

15. The solution set for the inequality  $5x - 34 \geq 2x - 4$  is

(a)  $x > 10$

(b)  $x \geq 10$

(c)  $x \leq 10$

(d)  $x < 10$





### Answer key

1. (c): substitute x in the given equation and obtain the value of y
2. (b): On factoring RHS as a trinomial, we get  $6x^2 - 21x + 18 = 3(2x-3)(x-2)$ . Hence  $a=b=1$ ;  $a-b=0$
3. (d): cross multiply, find the value of x and then square the obtained value
4. (d): As  $(x+1)$  is a factor of the polynomial,  $x=-1$  is a solution for (polynomial = 0)
5. (b): Find x, y and z;  $z=13>5=x=y$
6. (c):
7. (c): over here,  $a=x$  and  $d=y$
8. (c): Only 
$$\begin{cases} x - y = 2 \\ 2x + 4y = 3 \end{cases}$$
 can be solved to get a unique solution.
9. (c): Take the square root of the term
10. (a): Substitute the given values of a and x in the given formula
11. (b): Divide both the numerator and denominator by -5x
12. (c): Take the square root of first term and cube root of second term in the equation and then add the 2 terms
13. (a): Substitute values given in the options one by one and check
14. (d):
15. (b): Solve the inequality

