



# TSIA2 Mathematics Practice Test 1

Total Questions: 20

## About This Test

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1. What is the slope of the line whose equation is  $3x = -2y + 1$ ?

A.  $-\frac{3}{2}$

B.  $-\frac{2}{3}$

C.  $\frac{1}{2}$

D. 3

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2. Which of the following statements is true?

A.  $\sqrt{76}$  is between 8 and 9.

B.  $\sqrt{46}$  is greater than 7.

C.  $\sqrt{37}$  is less than 6.

D. 5 is between  $\sqrt{26}$  and  $\sqrt{28}$ .

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3. What is the solution set of the equation  $x^2 = -4x$ ?

A.  $\{-4\}$

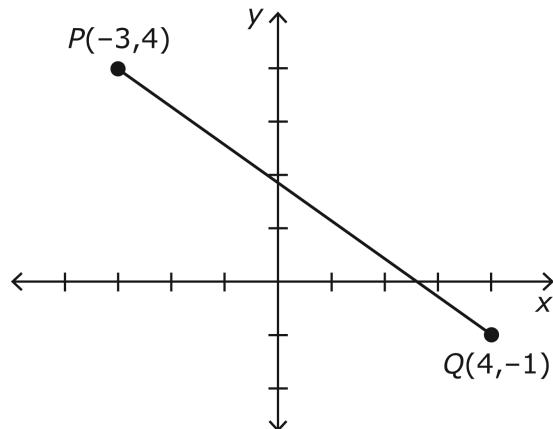
B.  $\{-4, 0\}$

C.  $\{4\}$

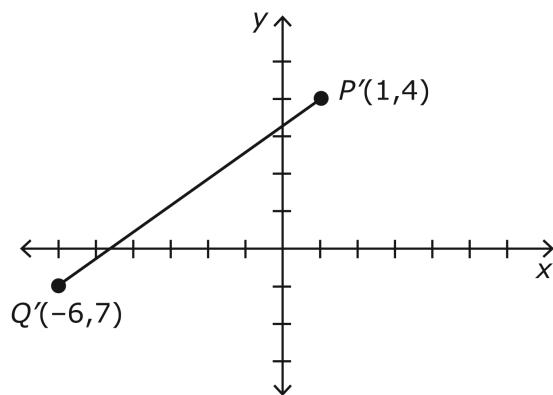
D. empty set

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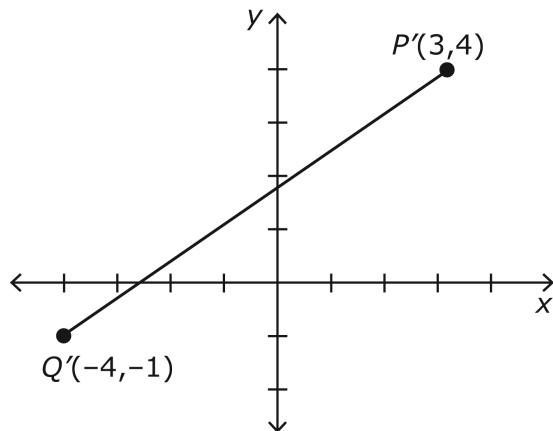
4. Which of the following is the image obtained by reflecting the segment  $PQ$  over the line  $y = -1$ ?



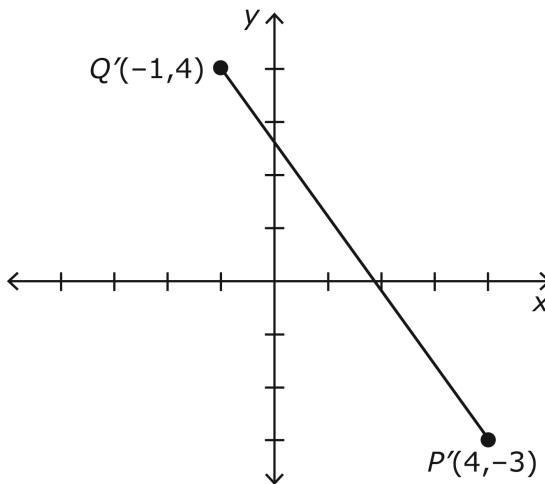
A.



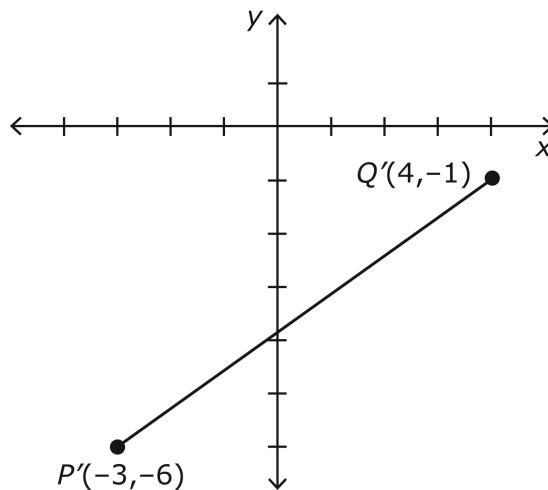
B.



C.



D.



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5. Determine the midpoint of the segment  $PQ$  with endpoints  $P(0, -8)$  and  $Q(-2, -4)$ .

- A.  $(-1, -6)$
- B.  $(1, -2)$
- C.  $(-4, -3)$
- D.  $(4, 1)$

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6. Which of the following expressions is equivalent to  $-6x^2 - x + 2$ ?

- A.  $-(2x + 3)(2x - 1)$
- B.  $(3x - 2)(2x - 1)$
- C.  $(3x + 2)(2x - 1)$
- D.  $-(3x + 2)(2x - 1)$

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7. A student wants to determine the ideal amount of exposure to water and artificial light needed for her tomato plants to flourish. She has 10 plants. She exposes each to light for a specified amount of time daily and gives each a certain amount of water daily for 15 days, as shown in the table below.

	Amount of light per day	Amount of water per day	Height after 5 days (inches)	Height after 10 days (inches)	Height after 15 days (inches)
Plant 1	2 hours	$\frac{1}{2}$ cup	$\frac{1}{2}$ in	1 in	$1\frac{3}{4}$ in
Plant 2	2 hours	1 cup	$\frac{1}{4}$ in	$\frac{3}{4}$ in	1 in
Plant 3	4 hours	$\frac{1}{2}$ cup	$\frac{1}{2}$ in	$1\frac{1}{4}$ in	2 in
Plant 4	4 hours	1 cup	$\frac{1}{2}$ in	1 in	$1\frac{1}{2}$ in
Plant 5	6 hours	$\frac{1}{2}$ cup	$\frac{3}{4}$ in	$1\frac{1}{2}$ in	$2\frac{1}{4}$ in
Plant 6	6 hours	1 cup	1 in	$1\frac{3}{4}$ in	$2\frac{1}{4}$ in
Plant 7	8 hours	$\frac{1}{2}$ cup	$1\frac{1}{4}$ in	$2\frac{3}{4}$ in	$4\frac{1}{4}$ in
Plant 8	8 hours	1 cup	$1\frac{3}{4}$ in	$2\frac{1}{4}$ in	$3\frac{1}{2}$ in
Plant 9	10 hours	$\frac{1}{2}$ cup	$\frac{3}{4}$ in	$1\frac{1}{4}$ in	$2\frac{1}{4}$ in
Plant 10	10 hours	1 cup	1 in	$1\frac{1}{4}$ in	$1\frac{3}{4}$ in

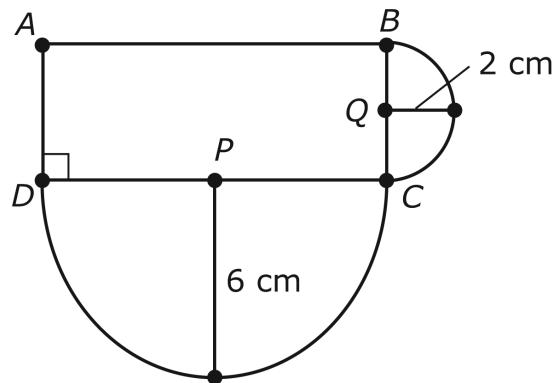
Which of the following is an accurate conclusion based on these data?

- A. The longer the plants were exposed to the light each day, the less they grew.
- B. Plants given more water grew more.
- C. Keeping the light exposure the same, the plants given 1 cup of water daily always had more growth in 5-day periods than those given  $\frac{1}{2}$  cup of water daily.
- D. The ideal combination is providing 8 hours of light and  $\frac{1}{2}$  cup of water daily.

8. Jason's junior baseball league consists of 32 twelve-year-olds and 28 thirteen-year-olds. Which of these is the ratio of thirteen-year-olds to the total number of twelve- and thirteen-year-olds in the league?

- A. 8 to 15
- B. 8 to 7
- C. 7 to 8
- D. 7 to 15

9. Compute the area of the figure below, assuming  $ABCD$  is a rectangle and that  $P$  and  $Q$  are centers of two semicircles.



- A.  $(12 + 20\pi)$  square centimeters
- B.  $(12 + 40\pi)$  square centimeters
- C.  $(48 + 20\pi)$  square centimeters
- D.  $(48 + 40\pi)$  square centimeters

10. If  $F(x) = \frac{2}{3}x + \frac{7}{4}$ , compute  $F\left(-\frac{3}{8}\right)$ .

- A.  $\frac{2}{9}$
- B.  $\frac{3}{4}$
- C.  $\frac{11}{12}$
- D.  $\frac{3}{2}$

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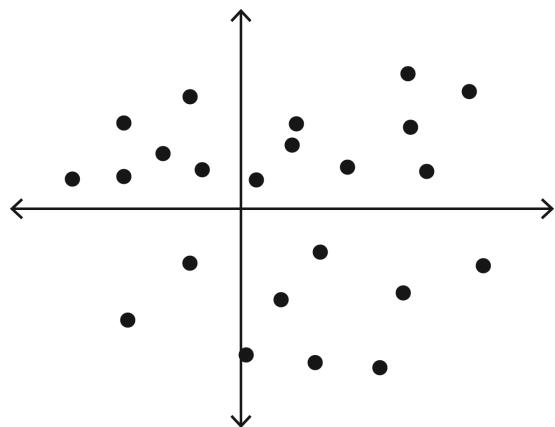
11. At a bakery, the ratio of apple pies to pumpkin pies was 5:7. There were 14 pumpkin pies. How many pies, in total, were there?

- A. 10
- B. 19
- C. 24
- D. 26

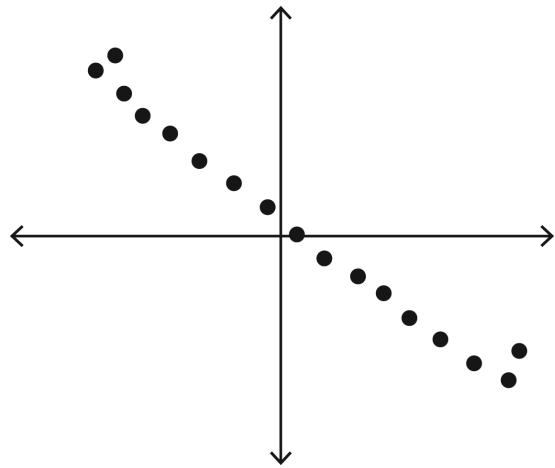
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12. Which of these scatterplots has a correlation coefficient closest to 1?

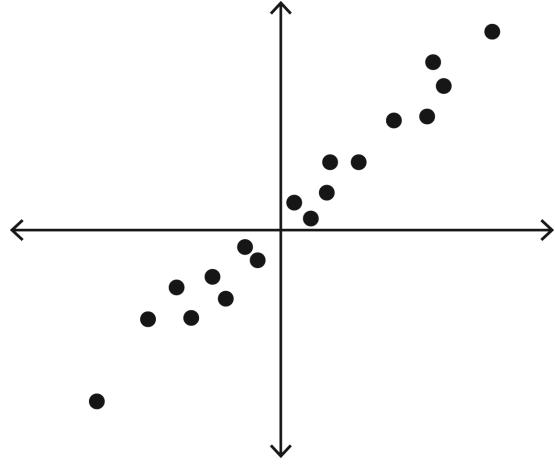
A.



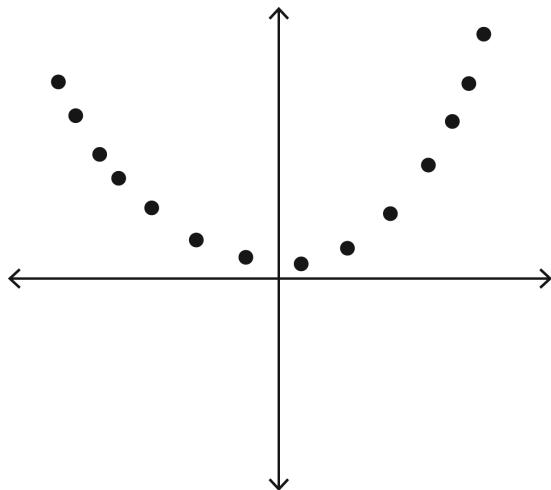
B.



C.



D.



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13. If  $g(x) = 8 - x^3$ , determine the inverse function  $g^{-1}(x)$ .

- A.  $g^{-1}(x) = \frac{1}{8-x^3}$
- B.  $g^{-1}(x) = 2 - \sqrt[3]{x}$
- C.  $g^{-1}(x) = (8-x)^3$
- D.  $g^{-1}(x) = \sqrt[3]{8-x}$

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14. Kris cashed a check for \$500 and asked for five- and ten-dollar bills. The teller gave him 60 bills. How many five-dollar bills did he receive?

- A. 20
- B. 25
- C. 35
- D. 40

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15. Solve for  $x$ :  $\frac{2}{x+1} + \frac{9}{x(x+1)} = 2$

A.  $x = -\frac{7}{2}$

B.  $x = -\frac{3\sqrt{2}}{2}$  and  $x = \frac{3\sqrt{2}}{2}$

C.  $x = \sqrt{\frac{9}{2}}$

D.  $x = -\frac{9}{2}$  and  $x = \frac{9}{2}$

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16. Sociologists asked 200 local high school students if they felt that earning good grades or being good at playing sports was more important. The students were selected randomly from District A and District B. The data are as follows:

		Which is more important?	
		Earning good grades	Being good at playing sports
School District A		52	68
School District B		60	20

What is the probability that a randomly selected student believes earning good grades is more important given that they are from District B?

A.  $\frac{3}{10}$

B.  $\frac{3}{4}$

C.  $\frac{15}{58}$

D.  $\frac{13}{30}$

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17. Suppose  $P$  represents the amount of a dinner bill, before tax, at a local sushi restaurant. The restaurant charges 6% tax, and you wish to leave the waiter a 18% tip before tax. Which of these expressions represents the amount of the tip you will pay?

A.  $1.24P$   
B.  $0.18P$   
C.  $0.18(1.06P)$   
D.  $0.24P$

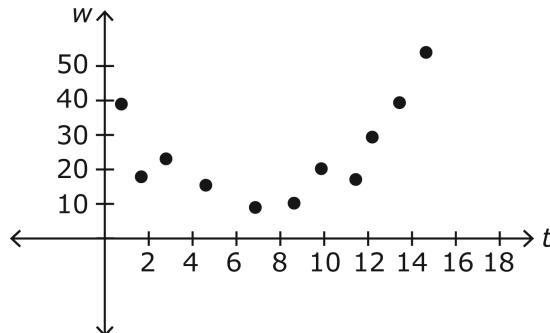
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18. Which of these equations can be used to determine the number of grams of a 5% potassium solution and the number of grams of a 13% potassium solution that must be mixed to make 56 grams of an 8% potassium solution? Let  $x$  be the number of grams of 5% potassium solution needed.

A.  $0.05x + 0.13(x - 56) = 0.08(56)$   
B.  $0.05x + 0.13(56 - x) = 0.08(56)$   
C.  $0.05x(56 - x) + 0.13x = 0.08(56)$   
D.  $0.05x + 0.08(56 - x) = 0.13(56)$

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19. The following scatterplot shows data regarding the whale population in a certain coastal region.



Here,  $w$  is the estimated number of whales living in that area and  $t$  represents the year, where  $t = 0$  corresponds to 2,000. Which of the following is the best choice for the equation of the best fit curve describing this data?

A.  $y = -32.1(t - 9)^2 + 9.8$

B.  $y = 4.25t + 17.5$

C.  $y = 20.8(t - 7.76)^2 + 8.9$

D.  $y = 3.12e^{(t - 7.1)}$

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20. An airplane makes a 1,200-mile flight with a tail wind and then follows the same route for the return flight, this time against the same wind. The round trip takes 5 hours 45 minutes. The plane's speed in still air is 575 miles per hour. Which equation can be used to determine the speed of the wind,  $x$ ?

A.  $\frac{575-x}{1,200} + \frac{575+x}{1,200} = 11.5$

B.  $\frac{575-x}{575+x} = \frac{1,200}{5.75}$

C.  $\frac{1,200}{575-x} + \frac{1,200}{575+x} = 5.75$

D.  $\frac{1,200}{x+575} + \frac{1,200}{x-575} = 5.75$

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# Answer Key

1. A      5. A      9. C      13. D      17. B

2. A      6. D      10. D      14. A      18. B

3. B      7. D      11. C      15. B      19. C

4. D      8. D      12. C      16. B      20. C