I

The University of the State of New York
REGENTS HIGH SCHOOL EXAMINATION

ALGEBRA I

Wednesday, June 17, 2026 — 9:15 a.m. to 12:15 p.m., only

Student Name Mr. Sibol

School Name JMAP

The possession or use of any communications device is strictly prohibited when taking this examination. If you have or use any communications device, no matter how briefly, your examination will be invalidated and no score will be calculated for you.

Print your name and the name of your school on the lines above.

A separate answer sheet for **Part I** has been provided to you. Follow the instructions from the proctor for completing the student information on your answer sheet.

This examination has four parts, with a total of 35 questions. You must answer all questions in this examination. Record your answers to the Part I multiple-choice questions on the separate answer sheet. Write your answers to the questions in **Parts II**, **III**, and **IV** directly in this booklet. All work should be written in pen, except for graphs and drawings, which should be done in pencil. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. Utilize the information provided for each question to determine your answer. Note that diagrams are not necessarily drawn to scale.

The formulas that you may need to answer some questions in this examination are found at the end of the examination. This sheet is perforated so you may remove it from this booklet.

Scrap paper is not permitted for any part of this examination, but you may use the blank spaces in this booklet as scrap paper. A perforated sheet of scrap graph paper is provided at the end of this booklet for any question for which graphing may be helpful but is not required. You may remove this sheet from this booklet. Any work done on this sheet of scrap graph paper will *not* be scored.

When you have completed the examination, you must sign the statement printed at the end of the answer sheet, indicating that you had no unlawful knowledge of the questions or answers prior to the examination and that you have neither given nor received assistance in answering any of the questions during the examination. Your answer sheet cannot be accepted if you fail to sign this declaration.

Notice ...

A graphing calculator and a straightedge (ruler) must be available for you to use while taking this examination.

DO NOT OPEN THIS EXAMINATION BOOKLET UNTIL THE SIGNAL IS GIVEN.

Part I

Answer all 24 questions in this part. Each correct answer will receive 2 credits. No partial credit will be allowed. Utilize the information provided for each question to determine your answer. Note that diagrams are not necessarily drawn to scale. For each statement or question, choose the word or expression that, of those given, best completes the statement or answers the question. Record your answers on your separate answer sheet. [48]

Use this space for computations.

1 What is the 20th term of the arithmetic sequence 4, 7, 10, 13, ...?

(1) 61
(2) 64
(3) 79
(4) 83

$a_{20} = 4 + 3(20-1) = 61$

2 What is the value of x in the equation $0.5x - 4 = 8 - x$?

(1) 6
(2) 8
(3) 18
(4) 24

$x - 8 = 16 - 2x$
$3x = 24$
$x = 8$

3 The binomial $4x^2 - 25$ is equivalent to

(1) $4(x + 5)(x - 5)$
(2) $4(x - 5)(x - 5)$
(3) $(2x - 5)(2x + 5)$
(4) $(2x - 5)(2x - 5)$

4 A function is defined by the following set of points:

$$\{(3, -4), (-4, 3), (1, 1), (x, 2)\}$$

What is a possible value for x?

(1) 1
(2) 2
(3) 3
(4) -4

Use this space for computations.

5 The expression $(4xy^2)^3$ is equivalent to

(1) $12x^3y^6$

(2) $12x^3y^8$

(3) $64x^3y^6$

(4) $64x^3y^8$

6 Allison was asked to write a third-degree trinomial with a leading coefficient of 4 and a constant term of 5. Which expression satisfies these conditions?

(1) $4x^3 - 5$

(2) $3x^4 + 5$

(3) $4x^3 + 8x^2 + 5$

(4) $3x^4 + 2x^3 - 5$

7 Given the sequence 128, 64, 32, ..., which formula could be used to find the nth term of this sequence?

(1) $a_n = 128(-2)^{n-1}$

(2) $a_n = 128\left(\frac{1}{2}\right)^{n-1}$

(3) $a_n = 128 - 2(n - 1)$

(4) $a_n = 128 + \frac{1}{2}(n - 1)$

$\frac{64}{128} = \frac{1}{2}$

8 When a bicyclist increases the pressure on the brakes, the speed of the bicycle decreases. This relationship can best be described as a

(1) negative correlation and causal relationship

(2) negative correlation and non-causal relationship

(3) positive correlation and causal relationship

(4) positive correlation and non-causal relationship

Use this space for computations.

9 A garden club plans to plant 40 flowering plants this year. They will only purchase daffodils that cost \$4 per plant and tulips that cost \$5 per plant. All prices include tax. The club has \$170 to spend on plants. Which equation could be used to find the number of daffodil plants, d, the club purchases?

(1) $4d + 5(170 - d) = 40$

(2) $4d + 5(40 - d) = 170$

(3) $5d + 4(170 - d) = 40$

(4) $5d + 4(40 - d) = 170$

10 A function is defined as $h(x) = x^2 - 3x + 1$. What is the value of $h(-1)$?

(1) 1

(2) 2

(3) 3

(4) 5

$(-1)^2 - 3(-1) + 1$

$1 + 3 + 1$

5

11 The zeros of $p(x) = x(3x + 2)(x - 5)$ are

(1) $-\frac{2}{3}$ and 5, only

(2) $\frac{2}{3}$ and -5, only

(3) $-\frac{2}{3}$, 0, 5

(4) $\frac{2}{3}$, 0, -5

12 If $f(x) = 1.25^x$ and $g(x) = 3x + 10$, what is the *smallest* positive integer of x for which $f(x) > g(x)$?

(1) 18

(2) 19

(3) 67

(4) 69

Use this space for computations.

13 What is an equation of the line that passes through the points (2, 5) and (−2, −1)?

(1) $y - 5 = \frac{2}{3}(x - 2)$

(2) $y - 5 = \frac{3}{2}(x - 2)$

(3) $y - 2 = \frac{2}{3}(x - 5)$

(4) $y - 2 = \frac{3}{2}(x - 5)$

$m = \frac{5 - -1}{2 - -2} = \frac{6}{4} = \frac{3}{2}$

14 At a local high school, students were asked to name the sport they like to watch the most. The results are summarized in the table below.

	Football	Basketball	Baseball
Male	40	35	15
Female	20	40	10

$\frac{40}{20+40+10} \approx 57\%$

Approximately what percentage of female high school students preferred to watch basketball?

(1) 35

(2) 40

(3) 53

(4) 57

15 An equation that yields the same solutions as $x^2 - 10x - 24 = 0$ is

(1) $(x + 5)^2 = 1$

(2) $(x - 5)^2 = 1$

(3) $(x + 5)^2 = 49$

(4) $(x - 5)^2 = 49$

$x^2 - 10x + 25 = 24 + 25$

$(x - 5)^2 = 49$

16 The function $f(x)$ is shifted three units right and four units up. The result of this transformation is

(1) $f(x - 3) + 4$

(2) $f(x + 3) + 4$

(3) $f(x + 4) - 3$

(4) $f(x - 4) - 3$

Use this space for computations.

17 Hana was asked to solve a quadratic equation. Her first step is shown below.

$$x^2 - 8x = 3$$

Step 1: $x^2 - 8x + 16 = 3 + 16$

The property that Hana used is the

(1) distributive property
(2) commutative property
(3) additive inverse property
(4) addition property of equality

18 A data set is given below:

28 28 28 28 32 32 34 34 40 42

What is the value of the upper quartile of this data set?

(1) 28
(2) 32
(3) 34
(4) 42

19 When $-3x^2 + 7x - 1$ is subtracted from $2x^2 - 3x + 10$, the result is

(1) $5x^2 + 4x + 9$
(2) $5x^2 - 10x + 11$
(3) $-5x^2 + 4x + 9$
(4) $-5x^2 + 10x - 11$

20 The value of a home in Buffalo can be modeled by the function $V(t) = 96{,}949(1.0448)^t$, where $V(t)$ is the value of the house after t years. What is the percent of increase in the value of the home each year?

(1) 1.0448%
(2) 0.0448%
(3) 0.448%
(4) 4.48%

Use this space for computations.

21 A rod is an old English measure of distance that is equivalent to 5.5 yards. How many inches are 2.5 rods?

[1 yard = 3 feet]

(1) 66

(2) 165

(3) 198

(4) 495

$2.5r \cdot \frac{5.5y}{1r} \cdot \frac{3ft}{1yd} \cdot \frac{12in}{1ft} = 495"$

22 When solving the equation $2x^2 - 3x - 6 = 0$ using the quadratic formula, the solutions are

(1) $\frac{3 \pm \sqrt{57}}{4}$

(2) $\frac{3 \pm \sqrt{39}}{4}$

(3) $\frac{-3 \pm \sqrt{57}}{4}$

(4) $\frac{-3 \pm \sqrt{39}}{4}$

$\frac{9+48}{3 \pm \sqrt{(-3)^2 - 4(2)(-6)}}{2(2)}$

23 For which function is the axis of symmetry $x = -4$?

(1) $f(x) = -x^2 - 4x - 1$

(2) $g(x) = -x^2 + 8x + 5$

(3) $h(x) = x^2 + 8x + 3$

(4) $k(x) = x^2 + x - 4$

$x = \frac{-8}{2(1)} = -4$

24 In simplest radical form, the product of $2\sqrt{6}$ and $5\sqrt{3}$ is

(1) 10

(2) 21

(3) $30\sqrt{2}$

(4) $10\sqrt{18}$

$10\sqrt{18} = 10\sqrt{9}\sqrt{2} = 30\sqrt{2}$

Part II

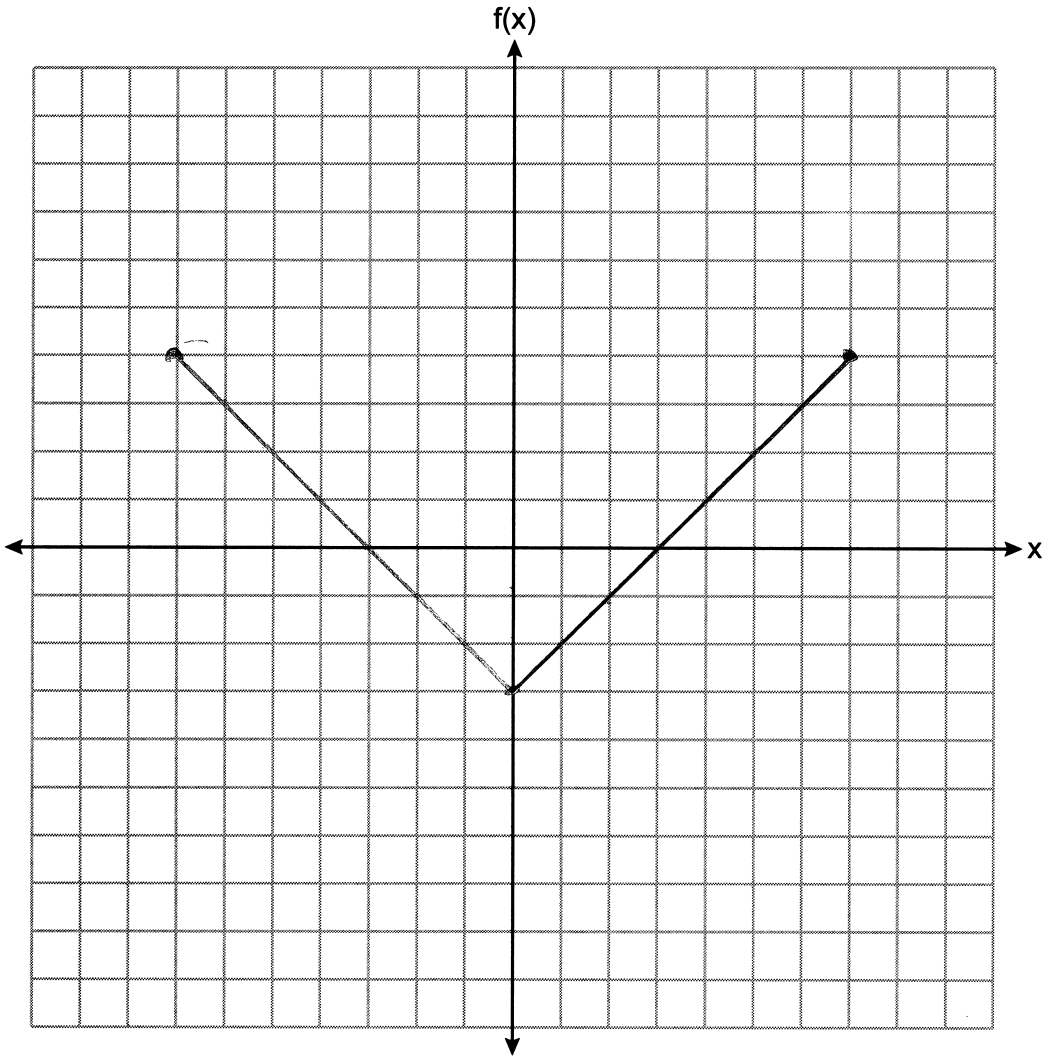
Answer all 6 questions in this part. Each correct answer will receive 2 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. Utilize the information provided for each question to determine your answer. Note that diagrams are not necessarily drawn to scale. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. All answers should be written in pen, except for graphs and drawings, which should be done in pencil. [12]

25 Express the product of $(1 - 2x)$ and $(3 - 5x)$ as a polynomial in standard form.

$3 - 5x - 6x + 10x^2$

$10x^2 - 11x + 3$

26 On the set of axes below, graph $f(x) = |x| - 3$ over the domain $-7 \leq x \leq 7$.



27 Solve the inequality algebraically:

$$-4x + 1 > 9 + 3(2x + 1) + x$$

$-4x > 8 + 6x + 3 + x$

$-4x > 11 + 7x$

$-11 > 11x$

$-1 > x$

28 Solve the formula $A = \frac{1}{2}bh$ for h in terms of A and b.

$$\frac{2A}{b} = \frac{bh}{b}$$

29 The table below shows the population of Manhattan for the years indicated, according to the U.S. Census Bureau.

Year	Population
1970	1,539,233
1980	1,428,285
1990	1,487,536
2000	1,537,195
2010	1,585,873
2020	1,643,734

Determine the average rate of change of the population per year between the years 1980 and 2020, rounded to the *nearest integer*.

$$\frac{1643734 - 1428285}{2020 - 1980} \approx 5386$$

30 Rewrite $\frac{5}{\sqrt{3}}$ as a fraction with a rational denominator.

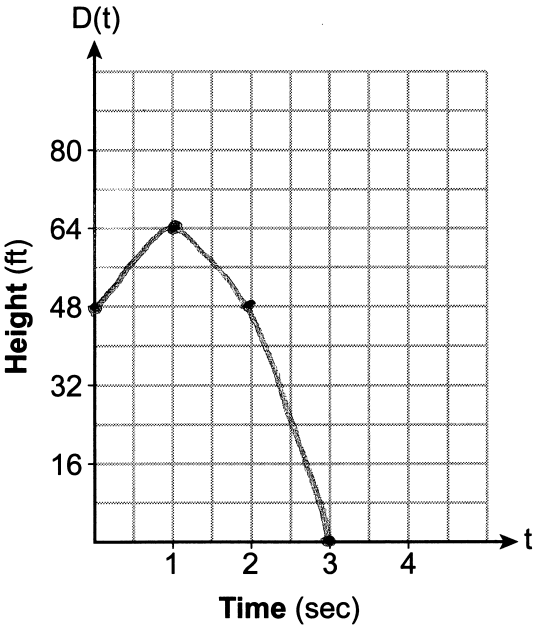
$\frac{5}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{5\sqrt{3}}{3}$

Part III

Answer all 4 questions in this part. Each correct answer will receive 4 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. Utilize the information provided for each question to determine your answer. Note that diagrams are not necessarily drawn to scale. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. All answers should be written in pen, except for graphs and drawings, which should be done in pencil. [16]

31 A ball is tossed up into the air from the deck of a building. The distance that the ball is above the ground t seconds after it is tossed can be modeled by the function $D(t) = -16t^2 + 32t + 48$, where the distance is measured in feet.

On the set of axes below, graph $D(t) = -16t^2 + 32t + 48$.



State the maximum number of feet above the ground that the ball will reach.

64

State the number of seconds after the toss it will take the ball to hit the ground.

3

32 Solve the following system of equations algebraically for all values of x and y.

$$y = -2x + 3$$
$$y = x^2 - 5x + 3$$

$x^2 - 5x + 3 = -2x + 3$

$x^2 - 3x = 0$

$x(x-3) = 0$

$x = 0, 3$

$y = -2(0) + 3 = 3$ $\quad$ $y = -2(3) + 3 = -3$

$(0, 3)$ $\quad$ $(3, -3)$

33 The table below shows the number of years of experience, x, working as a salesperson and their corresponding salaries, y, in thousands of dollars.

Number of Years of Experience (x)	Salary in Thousands of Dollars (y)
2	15
3	28
5	42
9	54
13	64
16	90

State the linear regression equation for these data. Round all values to the *nearest hundredth*.

$y = 4.61x + 11.93$

State the correlation coefficient for this data set, to the *nearest hundredth*.

0.98

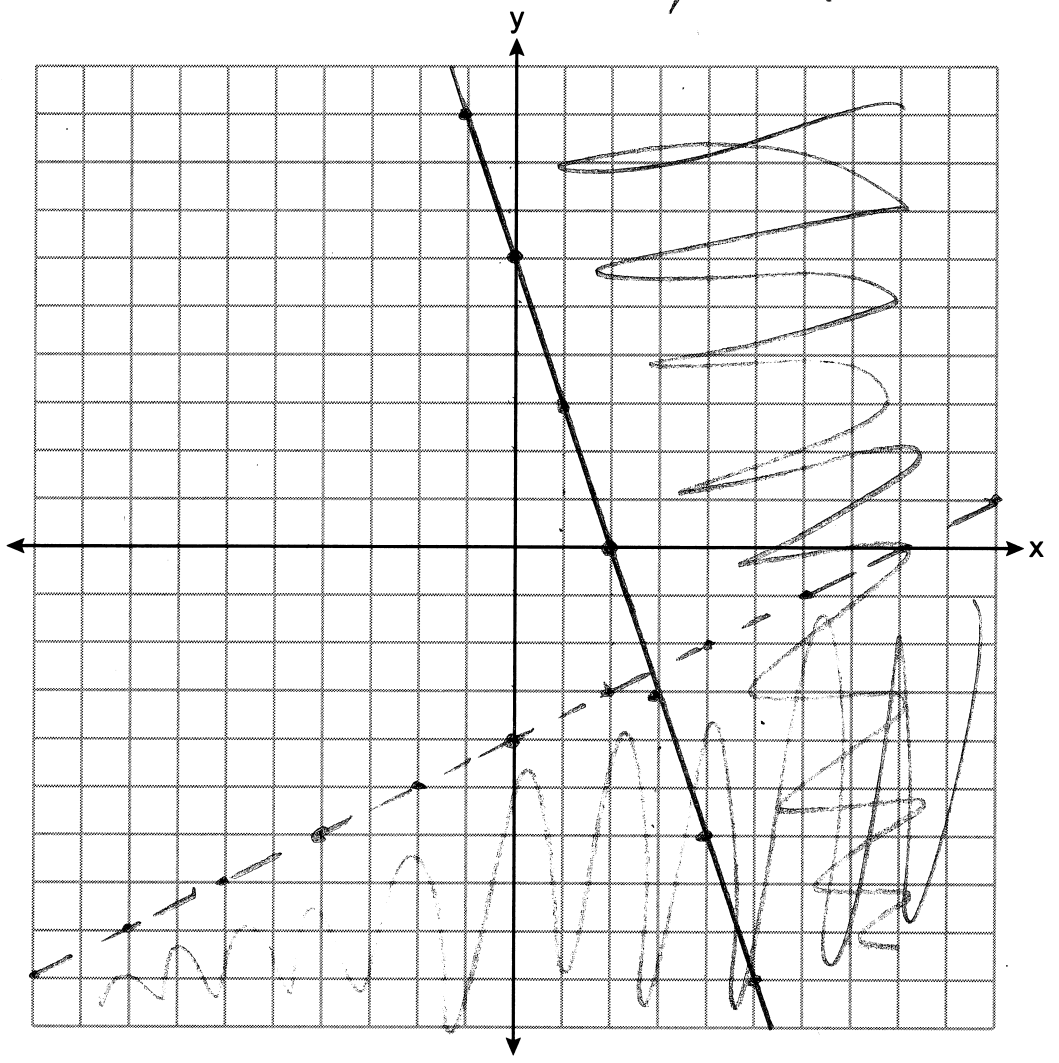
State what the correlation coefficient indicates about the linear fit of the data.

strong

34 Graph the system of inequalities on the set of axes below.

$2y < x - 8$
$3x + y \geq 6$

$y < \frac{1}{2}x - 4$
$y \geq -3x + 6$



State the coordinates of a point that satisfies both inequalities. Justify your answer.

(10,10) falls within both shaded areas

Part IV

Answer the question in this part. A correct answer will receive 6 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. Utilize the information provided to determine your answer. Note that diagrams are not necessarily drawn to scale. A correct numerical answer with no work shown will receive only 1 credit. All answers should be written in pen, except for graphs and drawings, which should be done in pencil. [6]

35 At a department store in a tax-free state, Jane can either buy three tank tops and two sweatshirts for \$52 or two tank tops and one sweatshirt for \$30.

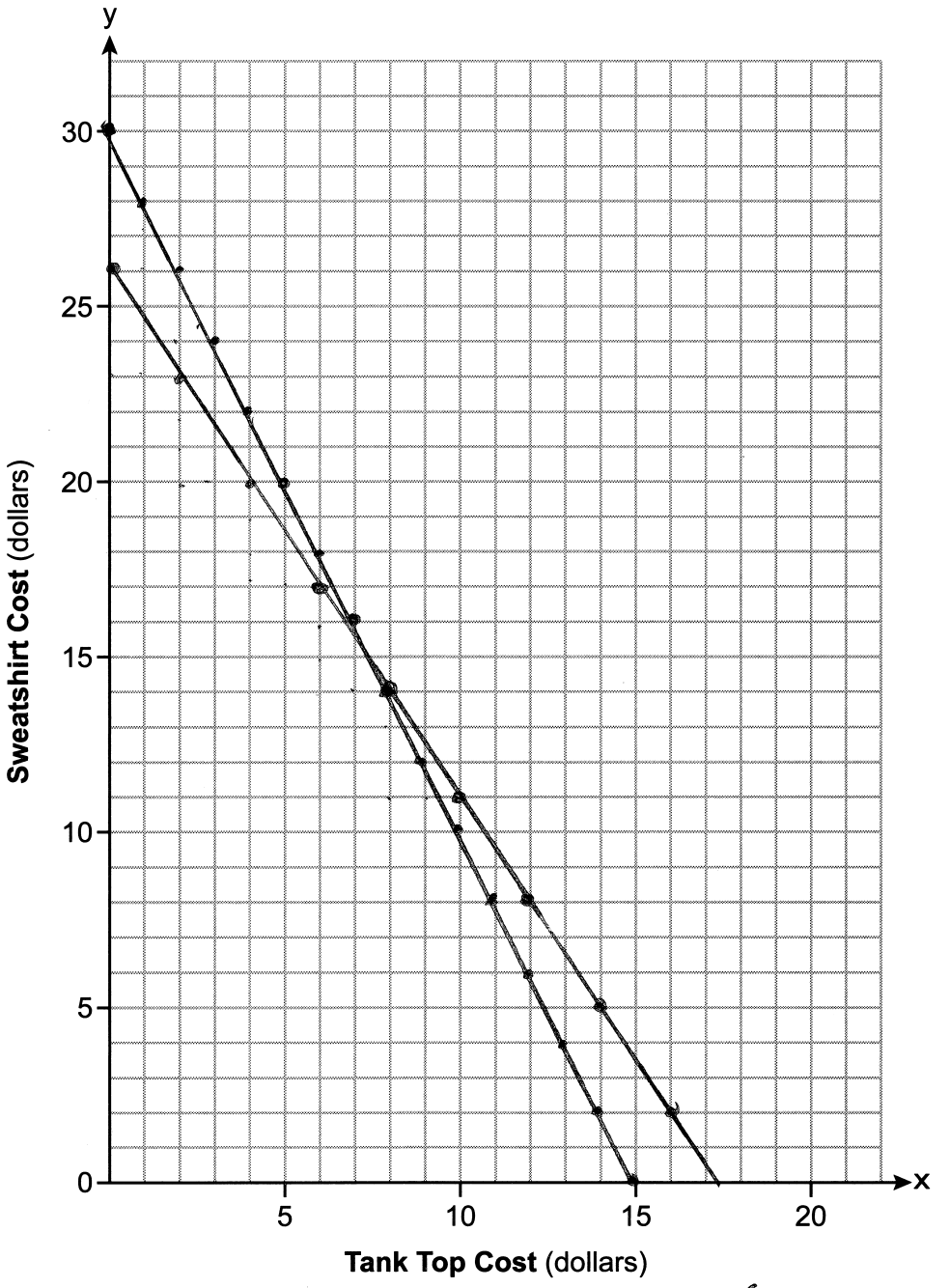
If x represents the price of one tank top and y represents the cost of one sweatshirt, write a system of equations that could be used to model this situation.

$3x + 2y = 52$

$2x + y = 30$

Question 35 is continued on the next page.

On the set of axes below, graph the system of equations.



State the coordinates of the point of intersection of your lines. (8, 14)

Explain what each coordinate of the point of intersection means in the context of the problem.

8 represents the cost of a tank top.
14 represents the cost of a sweatshirt.