C6

Equations, Inequalities, and Functions

CHAPTER ASSIGNMENT · 50 MARKS

Name _____ Class _____ No. _____ Date _____

Answer every question in the space given. Show your working. You may use your calculator from Lesson 9 onwards. The formula sheet gives the slope formula, both line forms and the quadratic formula.

Practice questions from *GED® Test Prep Mathematics*, Chapter 6 (Equations, Inequalities, and Functions), for classroom use. Where the book's question used a graph or its answer choices were pictures, the question has been rewritten in words or given new answer choices. The graphing questions in Lessons 6, 7 and 10, the Check yourself questions and the Chapter quiz are Guru Jazzy's own.

Lessons 1–2 · Equations and word problems

1.A Solve for the variable in each equation.

Problem	Answer	Problem	Answer	Problem	Answer
$7x = 63$		$23 + m = 51$		$-13 = y - 12$	
$x/4 = -16$		$12/x = -3$		$s + 16 = 8$	
$36 = x/3$		$16y = -48$		$-4x = 24$	
$14 - w = 42$		$18 = y/4$		$24 = 120/x$	

1.B Solve. Simplify each side first.

Problem	Answer	Problem	Answer
$3x - 20 = 130$		$2y - 8 = -3y - 18$	
$6m = 14m - 16$		$2x + 5 + 6x = -27$	
$5y + 3(y + 2) = 54$		$5p - 2 = 6p - 9$	
$3(3 + r) = 2r + 4$		$5n + 8 - n = 6(n - 1)$	

1.C Kayla and Erin worked 77 hours in total during Week 1. Kayla worked 36 of them. Let x = Erin's hours. Which equation could be used to find x?

A	B	C	D
x − 36 = 77	x + 77 = 36	x + 36 = 77	36x = 77

1.D A number divided by 4 is 32. What is the number?

A	B	C	D
8	28	128	512

1.E Three times a number increased by 9 is 15 less than six times the number. Which equation could be used to find the number, x?

A	B	C	D
3(9x) = 6(15x)	3x(9) = 6x − 15x	3x + 9 = 15 − 6x	3x + 9 = 6x − 15

1.F Kim earned x dollars on Friday. His wife earned $12 more than twice Kim's pay. Together they earned $174. How much did Kim earn? (Hint: x + (2x + 12) = 174.)

A	B	C	D
$54	$87	$108	$120

2.1 Two houses are for sale on the same street. The second has 1000 square feet less than twice the area of the first. Together they have 4400 square feet. What is the area of the first house? [2]

2.2 Julia has 24 coins, all dimes or quarters. Their total value is $4.50. How many are dimes? (Hint: the dimes are worth 0.10x and the quarters 0.25(24 − x).) [2]

2.3 The sum of four consecutive even numbers is 212. What is the third number? (Hint: let x, x + 2, x + 4 and x + 6 be the numbers.) [2]

2.4 A children's store sells pants for $6 and shirts for $4. Brenda bought 13 items and paid $62. How many shirts did she buy? [2]

2.5 Sylvia scored 10 points more than Wiley on a science exam. Greg scored 6 points less than Wiley. Together they scored 226 points. How many points did Sylvia score?

A	B	C	D
74	78	84	94

2.6 Two adults and four children paid $48 to get into the fair. A child's ticket is $6 less than an adult's. What does an adult's ticket cost?

A	B	C	D
$15	$12	$9	$6

Lesson 3 · Inequalities

3.1 Solve each inequality. Remember to reverse the symbol if you multiply or divide by a negative number.

Problem	Answer	Problem	Answer
$3x - 7 > 5$		$13 < 2x - 1$	
$4 + 2x \le -2$		$(4 + x)/5 \le 8$	
$2(x + 3) < 4$		$-4(x + 2) < 24$	
$-2x + 9 < 1$		$x + 6 \le 8x - 15$	
$5x + 14 > 2 + 7x$		$36 > 4(x - 12)$	
$3 < 5x - 27 < 53$		$30 \ge 5(x + 4) \ge 10$	

3.2 The perimeter of a square is $P = 4s$, where s is the length of one side. The perimeter is less than or equal to 64 inches. Which shows the possible lengths of a side, in inches?

A	B	C	D
$s \le 16$	$s \ge 16$	$s \le 60$	$s \le 256$

3.3 Draw the solution of $x \ge -2$ on a number line. Say whether you used an open or a closed dot, and why. [2]

Lessons 4–5 · Quadratic equations and problem solving

4.1 Multiply.

Problem	Answer	Problem	Answer
$(x + 4)(x + 2)$		$(x - 3)(x + 5)$	
$(x - 6)(x - 3)$		$(2x + 1)(x - 2)$	
$(x - 9)(x - 5)$		$(x - 5)(x - 5)$	

4.2 Factor each expression.

Problem	Answer	Problem	Answer
$x^2 + 4x + 3$		$x^2 - x - 6$	
$x^2 + 5x - 14$		$x^2 - 12x + 36$	
$2x^2 + 5x - 3$		$x^2 + x - 56$	

4.3 What are the two solutions of $x^2 - x = 20$?

A	B	C	D
-4 and 5	4 and -5	-10 and 2	-2 and 10

4.4 For which equation is $x = -4$ a solution?

A	B	C	D
$2x^2 - 8 = 0$	$x^2 - 8x + 64 = 0$	$x^2 - 2x - 15 = 0$	$2x^2 + 2x - 24 = 0$

4.5 What is the only positive solution of $2x^2 - 7x - 30 = 0$?

A	B	C	D
5	6	7	8

5.1 Use guess-and-check. A number divided by 2 is equal to 12 less than the number. What is the number?

A	B	C	D
12	20	24	28

5.2 Sandra raised three times as much money as Barbara, and Barbara raised $50 more than Matt. Together they raised $950. How much did Barbara raise?

A	B	C	D
$150	$175	$200	$325

5.3 Nelson is twice as old as Maria. Six years ago, Nelson was five times as old as Maria. How old was Nelson six years ago?

A	B	C	D
5	10	15	20

5.4 An adult's pass to an amusement park is $25 and a child's is $15. A group spent $440 on 20 passes. How many children's passes did they buy?

A	B	C	D
5	6	9	14

5.5 A rectangular garden is twice as long as it is wide. The distance around it is 120 feet. What is its width, in feet?

A	B	C	D
15	20	30	40

Lessons 6–7 · The coordinate plane and graphing a line

6.1 Write the ordered pair for each point.

Description	Ordered pair
4 right of the origin and 2 up	
3 left of the origin and 5 up	
1 left of the origin and 4 down	
2 right of the origin and 3 down	
on the x-axis, 5 left of the origin	
on the y-axis, 2 above the origin	

6.2 Draw a coordinate grid from −6 to 6 on both axes. Plot and label J (−3, 4), K (4, 0), L (2, −5) and M (−5, −2). Then name the quadrant each point is in. [4]

6.3 Two corners of a rectangle are at (−2, 3) and (4, 3). A third corner is at (4, −1). Where is the fourth corner? [1]

7.1 Complete each table, then graph both lines on one grid. [4]

x	y = 2x + 1	x	y = −x + 3
−2		−1	
0		0	
2		3	

7.2 Point C is at (−2, 5). The graph of which equation passes through point C?

A	B	C	D
y = x + 3	y = 2x + 9	y = −2x + 1	y = −x − 3

Lessons 8–9 · Slope and line equations

8.1 Use the slope formula to find the slope of the line through each pair of points.

Points	Slope	Points	Slope
(0, 2) and (4, 0)		(4, 2) and (2, 2)	
(6, 1) and (0, 3)		(1, 4) and (7, 6)	
(−2, 1) and (2, 4)		(3, 5) and (3, −1)	

8.2 Line N passes through (0, 4), (1, 2) and (2, 0). What is the slope of line N?

A	B	C	D
−4	−2	2	4

8.3 Line L passes through (1, 0) and has a slope of 3. Which point also lies on line L?

A	B	C	D
(0, 3)	(1, 3)	(2, 3)	(2, 5)

9.1 Use the slope-intercept form, y = mx + b, to find the equation of each line.

Point and slope	Equation
(1, −2); m = −4	
(−1, −4); m = 2	
(−4, 2); m = −1/2	

9.2 Use the point-slope form, $y - y_1 = m(x - x_1)$, to write the equation of each line. Then simplify it to slope-intercept form.

Point and slope	Point-slope form	Slope-intercept form
(2, 1); m = 3		
(1, −2); m = 1		

9.3 Find the equation of the line through each pair of points. Write it in slope-intercept form.

Points	Equation
(−5, 3) and (1, 1)	
(−3, 0) and (−2, 4)	

9.4 Which is an equation of the line through (−1, 0) and (2, −3)?

A	B	C	D
y = 3x + 3	y = −3x + 9	y = −x − 1	y = x − 5

9.5 Which is an equation of the line through (−3, 4) and (1, 4)?

A	B	C	D
y = 0	y = 4	y = x + 3	y = x + 7

9.6 Which equation describes the same line as $y - 2 = (1/2)(x - 6)$?

A	B	C	D
y = (1/2)x − 1	y = (1/2)x + 5	y = 2x − 10	y = (1/2)x − 4

9.7 A catering company orders 150 lb of clams for a banquet serving 100 people, and 30 lb for a dinner party of 20. How many pounds of clams is that per serving? [1]

9.8 A painter uses 15 gallons of paint to cover 300 square yards, and 8 gallons to cover 160 square yards. How many gallons cover 1 square yard? [1]

9.9 A scientist's data points are (3, 2.4), (8, 6.4) and (9, 7.2). Find the rate of y per unit of x. [1]

Lesson 10 · Systems of linear equations

10.1 Make a T-chart for each equation, graph both lines on one grid, and write the point where they cross: y = x − 2 and y = −x + 4. [4]

10.2 Solve each system by substitution. Write each answer as an ordered pair (x, y).

System	Solution
$7x - y = 22$ and $4x + 2y = 10$	
$x + y = 9$ and $2x - 3y = 8$	
$y = 3x + 15$ and $5x - 2y = -26$	

10.3 Where does the line $y = 2x - 1$ meet the line $y = -x + 5$?

A	B	C	D
(1, 1)	(2, 3)	(3, 2)	(−2, 7)

Lessons 11–13 · Patterns and functions

11.1 Find the next number in each pattern.

Pattern	Next	Pattern	Next
21, 26, 31, 36, …		1000, 500, 250, 125, 62.5, …	
1, 7, 14, 22, …		3, 5, 7, 9, 11, …	

11.2 Each y value in the table comes from the function $y = 2x - 1$. What is y when $x = 12$? [1]

x	1	2	3	4	5	12
y	1	3	5	7	9	

11.3 Each y value in the table comes from the function y = 3x + 5. What is y when x = 9? [1]

x	−2	−1	0	1	2	9
y	−1	2	5	8	11	

11.4 A scarf costs $5.00 each if you buy 1, $4.75 each for 2, $4.50 each for 3 and $4.25 each for 4. Which function gives the price per scarf, c, for n scarves?

A	B	C	D
c = $5.00 − $0.25n	c = $5.25 − $0.25n	c = $5.00n	c = $4.75 + $0.25n

12.1 The Chimney Sweep charges C = $25 + (s − $15), where s is the cost of any extra services. (a) Jan buys a smoke guard for $89. What is she charged? [1] (b) Ahmed has a damper installed for $255. What does he pay? [1]

12.2 Ricardo estimates his driving time in hours with t = m/60, where m is the number of miles. (a) How long will 330 miles take? [1] (b) How long will 255 miles take? [1]

12.3 Alicia's weekly pay at three jobs is: Job 1, P = $9.75h; Job 2, P = $70 + $8.40h; Job 3, P = $380 × h/38. If she works 30 hours, how much more does she earn at Job 2 than at Job 1?

A	B	C	D
$5.33	$29.50	$40.50	$59.00

12.4 Using the same three jobs, which statement is true if Alicia works 40 hours?

A	B	C	D
She earns the least at Job 3.	Job 1 pays more than Job 3.	Job 3 pays more than Job 2.	She earns the most at Job 2.

12.5 A company wins a $95,000 job that costs $5,400 a day in expenses. Its profit is P = $95,000 − $5,400d, where d is the number of days. What is the profit if the job takes 14 days?

A	B	C	D
$10,800	$19,400	$66,100	$75,600

13.1 Carla's daughter reads two books a week in a summer reading program. Which function gives the number of books she reads in w weeks?

A	B	C	D
f(w) = w + 2	f(w) = 2w	f(w) = 2b	2f(w) = w

13.2 Each day Bryan drives 100 miles before breakfast, then averages 60 miles per hour for h hours, and never more than 8 hours. Which are the domain and range of his daily driving function, f(h) = 100 + 60h?

A	B	C	D
Domain $0 \le h \le 8$; range $100 \le f(h) \le 580$	Domain $100 \le h \le 580$; range $0 \le f(h) \le 8$	Domain $h \le 0$; range $f(h) \le 100$	Domain $h \le 8$; range $60 \le f(h) \le 100$

13.3 Find the domain and range of each function.

Function	Domain	Range
f(x) = x + 4		
$f(x) = x^2 + 1$		
f(x) = 1/(x − 3)		

Chapter practice questions

P1 Which expression is equal to 6 − 4(x + 3)?

A	B	C	D
4x + 3	4x − 9	−4x − 3	−4x − 6

P2 Three increased by the product of 4 and a number is equal to the same number decreased by 6. What is the number?

A	B	C	D
−3	−1	1	3

P3 What is the equation of a line with a slope of −4 that passes through the point (1, 2)?

A	B	C	D
y = −4x + 2	y = −4x + 6	y = 4x + 1	y = 4x + 6

P4 The ordered pair (−2, −1) is a solution to which equation?

A	B	C	D
−4x − y = 7	4x + y = −7	4x − y = −7	−4x + y = −7

P5 For a two-week period, Jan earned $150 less than twice Tom's earnings. Together they earned $1380. How much did Tom earn?

A	B	C	D
$720	$660	$510	$360

P6 Samuel is paid $350 a month plus a 10 percent commission on his total sales, s. He needs to earn at least $2100 a month. Which shows the sales he needs?

A	B	C	D
s ≥ $17,500	s ≤ $17,500	s ≤ $21,000	s ≥ $21,000

P7 A bank charges $3.95 a month plus $0.10 for each check after the first ten: F = $3.95 + $0.10(n − 10). Greg writes 24 checks in March. What is his fee?

A	B	C	D
$6.35	$5.35	$2.40	$1.40

P8 The sum of four consecutive odd numbers is 104. What is the largest number?

A	B	C	D
23	25	27	29

P9 What is the slope of a line that passes through (2, 4) and (4, 6)?

A	B	C	D
−2	1	2	4

P10 What is the y-intercept of the line with a slope of 2 that passes through (1, 2)?

A	B	C	D
−2	−1	0	2

P11 The graphs of y = x + 3 and y = −2x − 3 are drawn on a grid. At what point do they cross? [2]

P12 What are the solutions of $x^2 - 5x = 24$?

A	B	C	D
−8 and 3	−6 and 4	8 and −3	4 and −6

P13 Cynthia is 6 times as old as Rebecca. In 6 years, Cynthia will be only 3 times as old as Rebecca. How old is Rebecca now?

A	B	C	D
3	4	8	12

P14 Which equation's graph passes through (0, −3) and (5, 7)?

A	B	C	D
$y = 3x - 3$	$y = 2x - 3$	$y = 2x + 7$	$y = -2x + 3$

P15 Sam and Daniel each gave the same amount toward a gift. Celia gave $12 more than Daniel, and Bob gave half as much as Celia. Together they gave $81. How much did Sam give?

A	B	C	D
$9	$15	$18	$21

P16 What is the solution of $-7x - 4 \geq x - 28$?

A	B	C	D
$x \leq 3$	$x \geq 3$	$x \leq -3$	$x \geq -4$

P17 What is the value of x in $-4(x + 2) - 10 = 5x$?

A	B	C	D
$x = -18$	$x = -2$	$x = 2$	$x = 18$

P18 Marcia has 35 bills, all $5 and $10, worth $240 in total. If x = the number of $5 bills, which equation could be used to find x?

A	B	C	D
$5x + $10x = 35	$5x + $10x + 35 = $240	$5(35 − x) + $10x = $240	$5x + $10(35 − x) = $240

P19 The sum of five consecutive numbers is 370. What is the fourth number?

A	B	C	D
73	74	75	76

P20 Point B is halfway between (−1, 5) and (−1, −3). What are the coordinates of point B? [1]

Check yourself

1 Solve 3(x − 2) + 4 = x + 10. Show each step, then check your answer by substituting it. [3]

2 Solve −3x + 5 > 17 and show the solution on a number line. Explain why the symbol changes direction. [3]

3 A line passes through (−2, −1) and (2, 7). Find its slope, its y-intercept and its equation in slope-intercept form. Then plot both points and draw the line on a grid. [4]

4 Solve $x^2 + 2x - 15 = 0$ by factoring. Then check one solution with the quadratic formula. [3]

5 A phone plan costs $20 a month plus $0.05 a minute. Another costs $0.15 a minute with no monthly fee. Write a function for each plan and find the number of minutes at which they cost the same. [4]

Chapter quiz

Q1 Solve $x - 23 = 41$.

A	B	C	D
18	64	41	−64

Q2 Solve $5y + 3(y + 2) = 54$.

A	B	C	D
3	4	5	6

Q3 Three consecutive numbers add up to 105. What is the greatest of them?

A	B	C	D
34	35	36	37

Q4 Solve $-2n - 5 \geq 3$.

A	B	C	D
$n \geq -4$	$n \leq -4$	$n \leq 4$	$n \geq 4$

Q5 When must you reverse the inequality symbol?

A	B	C	D
When you multiply or divide by a negative	When you add a negative number	When you subtract from both sides	When x is on the right-hand side

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Q6 What are the solutions of $x^2 - 3x - 4 = 0$?

A	B	C	D
−4 and 1	3 and 4	−3 and −4	4 and −1

Q7 Which point is 3 units left of the origin and 2 units up?

A	B	C	D
(3, −2)	(2, −3)	(−3, 2)	(−2, 3)

Q8 What is the slope of the line through (1, 4) and (7, 6)?

A	B	C	D
3	1/3	−1/3	2

Q9 What is the slope of a vertical line?

A	B	C	D
0	1	−1	Undefined

Q10 A line has slope 2 and passes through (3, 1). What is its equation?

A	B	C	D
y = 2x − 5	y = 2x + 1	y = 3x + 2	y = 2x + 5

Q11 Where do the lines y = x + 1 and 2x + y = 4 meet?

A	B	C	D
(2, 1)	(1, 2)	(0, 4)	(−1, 0)

Q12 If f(x) = 3x − 5, what is f(4)?

A	B	C	D
−2	12	7	17

End of assignment · Check your answers against the chapter at gurujazzy.com/subjects/ged-mathematics/chapter-6-equations-inequalities-and-functions/