C5

Algebra Basics, Expressions, and Polynomials

CHAPTER ASSIGNMENT · 20 MARKS

Name _____ Class _____ No. _____ Date _____

Answer every question in the space given. Do Lessons 1, 2 (Part A), 4 and 5 without a calculator. Show your working.

Practice questions from *GED® Test Prep Mathematics*, Chapter 5 (Algebra Basics, Expressions, and Polynomials), for classroom use. Where the book's expressions are printed as pictures that could not be read, Guru Jazzy wrote questions in the same style (all of Lesson 12 Part A). The Check yourself and Chapter quiz questions are Guru Jazzy's own.

Lesson 1 · The number line and signed numbers

1.1 Solve.

Problem	Answer	Problem	Answer	Problem	Answer
8 + (−3)		11 − (−2)		−4 − (−5)	
6 − 9		(−7) − (−3)		−15 + (−7)	
−60 − (−10)		−55 + 20		7 + (−3) + (−5) − 10	
−14 − (−6) + 18		6 − (−3) + (−5) + 8		−23 + (−11) − (−15) + 21	

1.2 Solve. You may not use a calculator.

Problem	Answer	Problem	Answer	Problem	Answer
(7)(−3)		(−8)(6)		(−2)(−9)	
12 ÷ (−4)		(−18) ÷ (−9)		(−75) ÷ 25	
(−3)(−5)(2)(−10)		20 ÷ (−5) ÷ (−2)		(−4)(−6)(−5)	
(12)(−2) ÷ (−2)		(−1)(2)(−3)(2)(−1)		(−5)(−2)(0)(−1)	

1.3 At noon the temperature in the high desert was 92°F. Over the next two hours it changed by +12°F, −5°F, +6°F, −3°F and +13°F. What was the temperature at the end?

A	B	C	D
95°F	103°F	115°F	131°F

1.4 The product of 2 and 8 is divided by −8. What is the result? [1]

Lesson 2 · Powers and roots

2.A Solve. You may not use a calculator.

Problem	Answer	Problem	Answer	Problem	Answer	Problem	Answer
3^2		4^1		25^0		$(-3)^2$	
5^3		4^{-2}		2^4		10^{-3}	
$\sqrt{49}$		$\sqrt{144}$		-3^2		2^{-3}	

2.B Use your calculator. Round to the nearest tenth where needed.

Problem	Answer	Problem	Answer	Problem	Answer
3^8		20^3		11^5	
$(3.3)^2$		$(-2)^8$		$\sqrt{90}$	

2.C A cube measures 6 inches on each side. Its volume is length × width × height. Which expression gives the volume in cubic inches?

A	B	C	D
6^1	6^2	6^3	6^6

Lesson 3 · Scientific notation

3.A Write each number in scientific notation.

Number	Scientific notation	Number	Scientific notation
2300		0.00042	
12,400,000		0.0095	
14,320,000,000		0.00000058	

3.B Write each number in standard form.

Scientific notation	Standard form	Scientific notation	Standard form
5.173×10^{-4}		3.7×10^6	
1.7×10^{-5}		9.16×10^5	

3.C One acre is 43,560 square feet. Which shows this number in scientific notation?

A	B	C	D
0.4356×10^6	4.356×10^4	4.356×10^3	43.56×10^3

Lesson 4 · Order of operations

4.A Find the value of each expression. You may not use a calculator.

Problem	Answer	Problem	Answer
$4(3) - 2 + (6 + 4 \cdot 2)$		$16 \div (10 - 6)^2$	
$5^2 - (5 - 7)(2)$		$3(-3) + (7 + 4)$	
$2^3 + (8 - 5)^2 - 3$		$(4 - 12)(-6) + (10 - 3)$	
$30 \div 3(5 - 4)$		$15 + (4)(3) - 2^2$	
$(4 + 2)^2 + (7 - 2)^3$		$7^2 \div (11 - 4) + (9 + 14)$	
$(5^2 + 6 - 3) \div (16 - 3^2)$		$3^3/(5 - 2) - (4 - 2)^2/2$	

4.B Infant care classes at a hospital cost $30 per person. A foundation will pay 75 percent of the cost, and the hospital pays the rest. 28 parents are enrolled. Which expression gives the amount, in dollars, the hospital pays?

A	B	C	D
$(75)(28)(30)$	$(28)(30) - (0.75)(30)$	$(1 - 0.75)(28)(30)$	$(1 - 0.75)(30) + 28$

4.C Find the value of $22 + 6[(14 - 5) \div 3(17 - 14)]$.

A	B	C	D
2.73	28	76	97

Lesson 5 · Absolute value

5.A Find each value.

Problem	Answer	Problem	Answer	Problem	Answer
abs(−107)		abs(−85.6)		abs(10.5)	
5 + abs(−6)		12 ÷ abs(−4)		−abs(110 − 201)	
−14 + abs(−28 ÷ 2)		49 ÷ (−abs(−7))		abs(−6) − abs(−7)	
706.2 − abs(−86.4 + 0.2)		abs(17) ÷ abs(−8)		abs(−5.5) × (−2)	

(Here abs(−107) means the absolute value of −107, which is usually written with two straight bars.)

5.B At 9:00 p.m. the temperature was −5°F. By 5:00 a.m. it was −15°F. By how many degrees did it change?

A	B	C	D
−15 degrees	−5 degrees	5 degrees	10 degrees

5.C Bob walks 5 blocks east to the barber shop, 6 blocks west to the grocery store, 2 more blocks west to the post office, then back home. All are on one street. How many blocks did he walk?

A	B	C	D
6	11	13	16

5.D A deli scale reads 25 ounces for meat that really weighs 23.5 ounces. The absolute error is the absolute value of the difference. What is it, in ounces?

A	B	C	D
1.5	23.5	25	48.5

Lesson 6 · Algebraic expressions

6.A Write an algebraic expression for each description. Use x and y.

Description	Expression
a number decreased by 7	
the product of 3 and the square of a number, increased by that number	
5 less than the quotient of 10 and a number	
the sum of −8 and the product of 7 and a number	
the square of the sum of a number and 6	
4 times the difference of two different numbers	
5 multiplied by the difference of a number squared and 3	

6.B A baseball team gives a charity $1500 plus $0.50 for each ticket over 2000 sold. x tickets are sold, and x is more than 2000. Which expression gives the donation?

A	B	C	D
$1500 + $0.50x	$1500 + $0.50(2000 − x)	$1500 + $0.50(x − 2000)	$1500(2000 − x)($0.50)

6.C Simplify.

Problem	Answer	Problem	Answer
$5 + x^2 - 3 + 3x$		$3x - 6(x - 9)$	
$4(y + 8) + 3(y - 6)$		$5 - (x - 3) + 4x$	
$5y^2 + 4 - 3y^2 + 5 + y$		$-3(x + 3) - 2(x + 4)$	

6.D Evaluate each expression.

Problem	Answer
$6(x + 2) + 7$ when $x = 2$	
$3x^2 + 3(x + 4)$ when $x = 3$	
$8x + 9y - (2x + y)$ when $x = 4$ and $y = 6$	
$x^2 - (x^3 + 3)$ when $x = -2$	

6.E Which expression is equal to $3x^2 + 3(x - 3) + x + 10$?

A	B	C	D
$x^2 + 9x + 1$	$3x^2 + 4x + 19$	$3x^2 - 2x + 19$	$3x^2 + 4x + 1$

6.F Write the prime factorization of 36 and of 70. Then find the GCF and LCM of 45 and 75. [4]

Lesson 7 · Expressions and calculator skills

7.A Use a calculator as needed.

Problem	Answer
$5x^2 + 3x + 5$ when $x = 2$	
$7x^2 + 2x - 6$ when $x = -3$	
$4y^3 + 2(y^2 - 4)$ when $y = -3$	
$6x^2 + 3y^2 + 2$ when $x = 4$ and $y = -4$	
$7 + 3(x - 2) - 2x^2$ when $x = 7$	
$-(x + y) + 3(2z - y)$ when $x = -5$, $y = -7$ and $z = 4$	
$(x^2 + 5)(x^2 - x + 2) - 3$ when $x = -4$	
$(x + y)(x - y)(2x + y)$ when $x = 9$ and $y = 4$	

7.B If $x = -5$ and $y = 2$, which expression has the greatest value?

A	B	C	D
$x + y$	$-x + y$	xy	$-2xy$

Lesson 8 · Understand polynomials

8.A Write monomial, binomial or trinomial for each.

Polynomial	Type	Polynomial	Type	Polynomial	Type
$25a$		$x - 4$		$x^3 + y - 1$	
$2x^4 + 3x + 4$		$g^2h^2i^2j^2$		$3x^2 - 5$	

8.B What is the sum of the exponents in $4x^3 + 3x^2 + 5$?

A	B	C	D
3	5	12	17

8.C What is the sum of the coefficients in $a - 3b - c + 2d$?

A	B	C	D
-3	-1	2	3

Lesson 9 · Simplify polynomials

9.A Write like or unlike for each pair of terms.

Terms	Like or unlike?	Terms	Like or unlike?	Terms	Like or unlike?
$4x^3$, x^3		b, b^2		$4a$, 4	
$2x^2y$, $8x^2y$		x^2y, xy^2		ab, $8ab$	

9.B Simplify each expression by combining like terms.

Problem	Answer	Problem	Answer
$3x^2y + 4x^2y$		$a - 7a + 3$	
$14ab + ab^2 + 2ab + 3$		$7g + 7gh + 7g + 7gh$	
$8x^2 - 4x + 7 + 4x^3 - x^2 + 7x - 2$		$-3x^2 + 6x - 2x^2 - 10x + 5$	

9.C What is the simplified form of $3a^2b + 4ab + 3a^2b + 5ab$?

A	B	C	D
$6a^3b^2 + 8a^3b^2$	$6a^2b + 9ab$	$6a^2b + 8ab$	$15a^6 + b^4$

Lesson 10 · Add and subtract polynomials

10.A Add or subtract.

Problem	Answer
$(5x^2 - 3x - 4) + (3x^2 - 2x + 6)$	
$(-8g^2 + 7g + 6) + (8g^2 - 7g - 5)$	
$(x + 16) - (4x + 3)$	
$(17a^2 - 4a - 4) - (16a^2 + 6a - 6)$	
$(p^2 + q^2 + 14) - (3p^2 - 4q^2 + 7)$	
$(ab + a + b + 6) - (8ab + a - b - 6)$	

10.B Which of the following equals $(5x^2 - 2x + 1) - (3x^2 - 3x - 2)$?

A	B	C	D
$x - 5x - 1$	$2x^2 - x + 3$	$2x^2 + x + 3$	$2x^2 - 5x + 3$

Lesson 11 · Multiply polynomials

11.A Multiply.

Problem	Answer	Problem	Answer
$(6x)(5x)$		$(7abc)(4bc)$	
$(17f^2gh^3)(2fh^4)$		$3z^2(6xy + 4z)$	
$-5ab(3b + 11c)$		$-9(-2x^4 + 3xy^2)$	

11.B Multiply using FOIL, then combine like terms.

Problem	Answer	Problem	Answer
$(x + 5)(x - 6)$		$(z + 9)(z - 9)$	
$(3x + 3)(3x + 5)$		$(y^2 - 6)(y^4 + 10)$	

11.C Which expression is equal to $(4ab + 2)(3ab - 7)$?

A	B	C	D
$7a^2b^2 + 22ab + 5$	$12a^2b^2 - 22ab - 14$	$12a^2b^2 + 22ab + 14$	$7a^2b^2 - 22ab - 5$

Lesson 12 · Divide polynomials

12.A Simplify by dividing by the common factor.

Problem	Answer	Problem	Answer
$(8x + 12)/4$		$(15y - 10)/5$	
$(6a^2 + 9a)/(3a)$		$(14x^3 + 7x^2)/(7x^2)$	
$(12m^4 - 8m^2 + 4m)/(4m)$		$(20x^2y - 5xy)/(5xy)$	

12.B James has 27x apples, Rachel has 51y oranges and Glen has 60z peaches. Which expression is the average number of pieces of fruit they have?

A	B	C	D
9x + 51y + 60z	46x + 46y + 46z	9x + 17y + 60z	9x + 17y + 20z

Chapter practice questions

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

A	B	C	D
4x + 3	4x − 9	−4x + 9	−4x − 6

P2 Kris makes d dollars. Heidi makes 75 dollars less than 3 times Kris's wage. What does Heidi make in terms of d?

A	B	C	D
d + 75	d − 225	3d − 75	3d − 225

P3 What is the product of 700 and 180,000, written in scientific notation?

A	B	C	D
12.6×10^9	1.26×10^8	1.26×10^9	1.26×10^{10}

P4 Which of the following is equivalent to $x^2 - 25$?

A	B	C	D
x(x − 25)	$(x - 5)^2$	(x + 5)(x − 5)	$(x - 25)^2$

P5 Multiply $7c^2(a^2 + 5b + 7c^2)$.

A	B	C	D
$7a^2c^2 + 35bc^2 + 49c^4$	$7(ac)^2 + 35(bc)^2 + 49c^4$	$7a^2 + 35b + 49c^4$	$a^2 + 5b + 14c^2$

P6 What is the value of 6(x − y) − 8x when x = −2 and y = 5?

A	B	C	D
−58	−26	2	34

P7 Every team member is paid 5p dollars. Team Alpha has 6k members, Team Beta 4p members and Team Delta 9h members. Which expression is the total paid, in dollars?

A	B	C	D
$1080hkp$	$1080hkp^2$	$120p^2k + 45ph$	$30kp + 20p^2 + 45hp$

P8 Which of the following is equal to $7x - [(5y)(2x) - 9y + 8x]$?

A	B	C	D
$x - 9y + 10xy$	$-3x - 4y$	$-x + 9y - 10xy$	$15x - 9y + 10xy$

P9 Simplify $(6x^2 + 5xy^2)(y) - (4xy - 9x)(4xy)$.

A	B	C	D
$5xy^3 - 16x^2y^2 + 42x^2y$	$5xy^3 - 16x^2y^2 - 30x^2y$	$6x^2y - 11x^2y^2 - 36xy^2$	$6x^2y + 5x^2y^2 - 36xy^2 + 16xy$

P10 An office has $4x$ workers, including 3 managers. Leaving out the managers, the average salary is $5x - 6$ dollars. What do the non-managers earn in total?

A	B	C	D
$20x^2 - 24x$	$20x^2 - 24x - 3$	$20x^2 - 9x + 18$	$20x^2 - 39x + 18$

Check yourself

1 Explain why $(-4)^2$ and -4^2 give different answers. Give both values. [2]

2 Write 0.000306 and 5,020,000 in scientific notation. Which is greater, and how can you tell from the powers of ten alone? [3]

3 A student says $20 - 8 \div 4 \times 2 = 19$. Show the correct steps and find the mistake. [3]

4 Subtract $(2x^2 - 5x + 1)$ from $(6x^2 + 3x - 4)$. Then multiply $(2x - 3)(x + 4)$. [4]

5 Simplify $(9x^3 - 6x^2 + 3x)/(3x)$. Check your answer by choosing $x = 2$ and working out both expressions. [3]

Chapter quiz

Q1 What is $-7 + 3$?

A	B	C	D
−10	−4	4	10

Q2 What is $(-6)(-4)(-1)$?

A	B	C	D
−24	−11	11	24

Q3 Which number is equal to 2^{-3}?

A	B	C	D
−8	−6	1/8	8

Q4 Which is 0.00042 written in scientific notation?

A	B	C	D
4.2×10^{4}	4.2×10^{-4}	4.2×10^{-3}	42×10^{-3}

Q5 Using the order of operations, what is $3 + 4 \times 2^{2}$?

A	B	C	D
28	67	100	19

Q6 What is −20 times the absolute value of (17 − 34)?

A	B	C	D
340	−54	−340	54

Q7 Which expression means “6 less than the product of 5 and a number”?

A	B	C	D
5x − 6	6 − 5x	5(x − 6)	6x − 5

Q8 On the TI-30XS, which key do you press to enter a negative number such as −4?

A	B	C	D
The − key beside +	The 2nd key	The x^2 key	The (−) key

Q9 Simplify: 4x − 3(x + 9) + 15

A	B	C	D
x + 42	7x + 42	x + 24	x − 12

Q10 Simplify: $(3x^2 + x + 4) - (7x^2 + 2x - 16)$

A	B	C	D
$-4x^2 + 3x - 12$	$4x^2 + x - 20$	$-4x^2 - x + 20$	$-4x^2 - x - 12$

Q11 Multiply using FOIL: $(x + 5)(x - 6)$

A	B	C	D
$x^2 - 30$	$x^2 - x - 30$	$x^2 + x - 30$	$x^2 - 11x - 30$

Q12 Simplify: $(10x^3 - 15x^2) \div (5x^2)$

A	B	C	D
$2x - 3$	$2x^3 - 3x^2$	$5x - 10$	$2x - 15$

End of assignment · Check your answers against the chapter at gurujazzy.com/subjects/ged-mathematics/chapter-5-algebra-basics-expressions-and-polynomials/