Solving Word Problems with Linear Equations

This booklet belongs to:_____

LESSON #	DATE	QUESTIONS FROM NOTES	Questions I need to review
1			
2			
3			
4			
5			
6			
7			
8			
9		**TEST**	

This booklet is homework and will be collected on the test day.

Your teacher has important instructions for you to write down below.

_____

_____

_____

What mark did you get on the practice test? /18

Did you do all your corrections?

Solving Problems with Linear Equations

- These outcomes have been met in the linear relations chapter and linear equations chapter.
- This chapter is recommended for increasing student confidence with word problems.
- This unit is often students' best chapter of the year and helps them grow in problem solving confidence.

IRP	#	Daily Topic	Key Ideas
B1 generalize a pattern arising from a problem-solving context using linear equations and verify by substitution [C, CN, PS, R, B3 model and solve problems using linear equations of the form: $ax = b^*$ $\frac{x}{a} = b,\ a \neq 0^*$ $ax + b = c^*$ $\frac{x}{a} + b = c,\ a \neq 0^*$ $a(x + b) = c^*$ $ax + b = cx + d^*$ $a(bx + c) = d(ex$ $\frac{a}{x} = b,\ a \neq 0^*$ *Where a, b, c, d, e, and f [C, CN, PS, V]	1.	Introduction to word problems 1 (pg. 3-6) • Write a linear equation to represent a given context Solve a given linear equation symbolically. • Solve a given problem using a linear equation and record the process. • Determine, by substitution, whether a given rational number is a solution to a given linear equation.	Jane is 3 years more than twice Johnny's age. The sum of their ages is 18. How old is each?
	2.	Consecutive number problems (pg. 7-10) • Write a linear equation to represent a given context Solve a given linear equation symbolically. • Solve a given problem using a linear equation and record the process. • Determine, by substitution, whether a given rational number is a solution to a given linear equation.	Find 3 consecutive even numbers such that the sum of the 1st and the 3rd numbers exceeds the 2nd number by 10.
	3.	Age problems part 2 (pg. 11-14) • Write a linear equation to represent a given context Solve a given linear equation symbolically. • Solve a given problem using a linear equation and record the process. • Determine, by substitution, whether a given rational number is a solution to a given linear equation.	Jon is 8 years older than his sister. In 3 years, he will be twice as old as she will be then. How old are they now?
	4.	**Coin Problems Part 1 (Pg. 15-17)** • Write a linear equation to represent a given context Solve a given linear equation symbolically. • Solve a given problem using a linear equation and record the process. • Determine, by substitution, whether a given rational number is a solution to a given linear equation.	A boy has 7 more dimes than quarters. The total value of the coins is $4.90. Find the number of dimes and quarters.
	5.	**Coin Problems Part 2 (Pg. 18-19)** • Write a linear equation to represent a given context Solve a given linear equation symbolically. • Solve a given problem using a linear equation and record the process. • Determine, by substitution, whether a given rational number is a solution to a given linear equation.	A collection of dimes and quarters is worth $15.25. There are 103 coins in all. How many of each is there?
	6.	Perimeter Problems Part 1 **(Pg. 20-22)** • Write a linear equation to represent a given context Solve a given linear equation symbolically. • Solve a given problem using a linear equation and record the process. • Determine, by substitution, whether a given rational number is a solution to a given linear equation.	The length of a rectangle is 3 times the width. The perimeter is 96cm. Find the width and length.
	7.	Perimeter Problems Part 2 (Pg. 22-25) • Write a linear equation to represent a given context Solve a given linear equation symbolically. • Solve a given problem using a linear equation and record the process. • Determine, by substitution, whether a given rational number is a solution to a given linear equation.	The length of a rectangle is 3 times the width. If the length is decreased by 4 m and the width is increased by 1 m. The perimeter will be 66. Find the dimensions of the original rectangle.
	8.	Chapter Review and Practice Test • Help students develop sound study habits. • Many students will graduate high school saying they do not know how to study for math tests.	
	9.	**Go over Practice Test**	
	10.	Unit Evaluation	

Translating Words into Algebra

Word Problems Notes:

Write an expression. Do not find the answer.

1. 3 more than 10	2. 5 less than 8	3. 2 times 3	4. 2 less than 3 times 4
5. 3 more than N	6. 5 less than N	7. 2 times N	8. 2 less than 3 times N

Use n to write an expression for each of the following:

9. Five more than a number	10. Ten more than a number
11. Six less than a number	12. A number decreased by 5
13. A number increased by 4	14. 5 times a number
15. Double a number	16. The Quotient of a number and 3
17. The product of a number and 6	18. 5 less than 3 times a number
19. 3 consecutive numbers	20. The value of m Nickels in cents

Age Word Problems Part One

Using the same variable, write an equation for each person's age.

21. Malcolm is 7 years older than Timmy. Malcolm= Timmy=	22. Mally is 4 years younger than Tammy. Mally= Tammy=	23. Mark is 4 times older than Nathan. Mark= Nathan=
24. Newton is 3 times older than Desmond. Newton= Desmond=	25. Marcus is 2 years older than Tommy. Marcus= Tommy=	26. Ally is 6 years younger than Teddy. Ally= Teddy=
27. Randy is 2 years younger than 4 times Billy's age. Randy= Billy=	28. Vincent is 3 years older than 2 times Bally's age. Vincent= Bally=	29. Dathon is 5 years younger than 7 times Jamie's age. Dathon= Jamie=

Challenge #1: Max is 7 years older than Jill. The sum of their ages is 41. How old are Max and Jill?

17,24

Use algebra to find each person's age. Verify your answer.

30. Max is 7 years older than Jill. The sum of their ages is 41. How old are Max and Jill.

STEP 1

Jill= J

Max=J+7

Step 2

Max's age + Jill's age =41

Step 3

(J+7) +J =41

Step 4

2J+7=41

2J=34

J=17

Jill =17 and Max=17+7=24

Check your answer 17+24=41☺

31. John is 12 years older than Bob. The sum of their age, is 60. How old are they?

24,36

32. Sarah is 5 years younger than Sam. Together their ages add to 49. How old is each?

33. Tony is 8 years younger than Jay. Together their ages add to 34. How old is each?

34. Bill is 5 times older than Bally. The sum of their ages is 54. How old are they?

35. Mike is 3 times younger than John. The sum of their ages is 36. How old is each?

Challenge #2: Jon is 3 years more than twice Mort's age. The sum of their ages is 18. How old is each?

Use algebra to solve each challenge. Verify your answer.

36. Mort is 3 years older than twice Jon's age. The sum of their ages is 18. How old is each?

STEP 1

Jon= J

Mort=2J+3

Step 2

Mort's age + Jon's age =41

Step 3

(2J+3) +J =18

Step 4

3J+3=18

3J=15

J=5

Jon =17 & Mort=2(5)+3=13

Check your an3wer→ 5+2(5)+3=18☺

5,13

37. Kerry is 4 years younger than twice Pam's age. Their ages add to 17. How old is each?

38. Bill is 7 years older than his sister. The sum of their ages is 23. How old is Bill?

39. Manudo is 5 years younger than Cisilee. The sum of their ages is 39. How old is each?

40. Jamie is 2 years older than twice Steve's age. Their ages add to 17. How old is each?

41. Kibben is 5 years younger than 7 times Kristin's age. The sum of their ages is 35. How old is each?

Consecutive Number Word Problems Part One

Using the same variable, write an expression to represent each number.

42. 3 consecutive numbers	43. 3 consecutive even numbers	44. 3 consecutive odd numbers
#1=	#1=	#1=
#2=	#2=	#2=
#3=	#3=	#3=

Challenge #3: Find 3 consecutive numbers whose sum is 45.

Challenge #4: Find 3 consecutive odd numbers whose sum is 147.

Using algebra find the value of each number. Verify your answer.

45. Find 3 consecutive numbers whose sum is 45.

STEP 1
#1=N, #2=N+1, #3=N+2

Step 2
#1+#2+#3=45

Step 3
N+(N+1)+(N+2)=45

Step 4
3N+3=45
3N=42
N=14
#1=14, #2=15 &#3=16

Check your answer→ 14+15+16=45☺

46. Find 3 consecutive numbers whose sum is 39.

12,13,14

47. Find 3 consecutive numbers whose sum is 339.

48. Find 3 consecutive odd numbers whose sum is 147.

STEP 1
#1=2N+1, #2=2N+3, #3=2N+5

Step 2
#1+#2+#3=147

Step 3
(2N+1)+(2N+3)+(2N+5)=147

Step 4
6N+9=147
6N=138
N=26→#1=2(23)+1=47
#1=**47**, #2=**49**, #3=**51**

Check your answer→ 47+49+51=147☺

47,49,51

49. Find 3 consecutive even numbers whose sum is 156.

50,52,54

50. Find 4 consecutive even numbers whose sum is 132.

51. Find 3 consecutive even numbers whose sum is 96.

52. Find 3 consecutive odd numbers whose sum is 999.

53. Find 3 consecutive odd numbers whose sum is 315.

Consecutive Number Word Problems Part Two

Using the letters A,B and C to represent the 1st,2nd, and 3rd numbers, write an equation for each of the following situations.

54. The sum of the first and the third number is equivalent to twice the second number.	55. Twice the third number and 4 times the second is equal to the first number decreased by eight.	56. The sum of the first three numbers is equal to the second number exceeded by 52.
57. The sum of the second number and the third number is equivalent to two less than the first number.	58. Twice the first number and 4 times the second is equal to the first number decreased by six.	59. The sum of the first two numbers is equal to the third number reduced by four.

Challenge #5: Find 3 consecutive even numbers such that the sum of the 1st and the 3rd numbers exceeds the 2nd number by 10.

8,10,12

Using algebra find each number. Verify your answer.

60. Find 3 consecutive even numbers such that the sum of the 1st and the 3rd numbers exceeds the 2nd number by 10.

A possible strategy:
STEP 1
#1=2N, #2=2N+2, #3=2N+4

Step 2
#1+#3=#2+10
Step 3
(2N)+(2N+4)=(2N+2)+10
Step 4
4N+4=2N+12
2N=8
N=4→#1=2(4)=8
#1=**8**, #2=**10** &#3=**12**
Check your answer→ 8+12=10+10☺

8,10,12 (See answer key for complete solution.)

61. Find 3 consecutive numbers such that the sum of the 1st and 3rd numbers exceeds the 2nd number by 14.

13,14,15

62. Find 3 consecutive odd numbers such that the sum of the 1st two numbers is 3 times the 3rd number diminished by 17.

7,9,11

63. Find 3 consecutive even numbers such that the sum of the 1st and 3rd is three times the 2nd diminished by 14.

64. Find 3 consecutive numbers such that the sum of the 1st and twice the 3rd is the same as four times the 2nd number diminished by 8.

65. Find 3 consecutive numbers such that the sum of twice the 1st and three times the 2nd is 1 more that 3 times the 3rd.

AGE WORD PROBLEMS PART 2

Using the same variable, write an expression for each person's age.

66. Bill's age now and Bill's age in 6 years.

Bill's age=

Bill's age in six years=

67. Lilly's age now and Lilly's age 7 years ago.

Lilly's age=

Lilly's age 7 years ago=

68. David's age now and David's age in 6 years.

David's age=

David's age in 6 years=

Challenge #6: Andy is twice as old as Kate. In 6 years, their ages will total 60. How old is each now?

Use algebra to find each person's age. Verify your answer.

69. Al is twice as old as Kate. In 6 years, their ages will total 60. How old is each now?

Solution:
STEP 1
Kate=K
Andy=2K
Step 2
Kate's age + 6yrs+Al's age +6 yrs=60
Step 3
K+6+2K+6 =60
Step 4
3K+12=60
3K=48
K=16
Kate=**16** & Al=2(16)=**32**
Check your answer→ 16+6+32+6=60☺

70. Mrs. Wong is 23 years older than her daughter. In 5 years their ages will total 63. How old are they now?

71. Matt is 3 times as old as Jenny. In 15 years, their ages will total 58. How old is each person now?

Age Word Problems Part Three

Make each equation true.

72. Sadie is twice Alex's age.

S = A

73. Tspray is six years older than Misseh.

t = M

74. Max is 9 times older than Harris.

M = H

Challenge #7: Jon is 8 years older than his sister. In 3 years, he will be twice as old as she will be then. How old are they now?

5,13

Use algebra to find each person's age. Verify your answer.

75. Jon is 8 years older than Sam. In 3 years, he will be twice as old as she will be then. How old are they now?

STEP 1
Sam=S→in 3 years→S+3
Jon=S+8→in 3 years→S+11
Step 2
(Sam's age + 3)times 2 =Jon's age +3
Step 3
2(S+3) =(S+11)
Step 4
2S+6=S+11
S=5
Sam=**5** & Jon=5+8=**13**
Check your answer→ (13+3)= 2(5+3)☺

76. Mel is 24 years younger than Joyce. In 2 years, Joyce will be 3 times as old as Mel will be then. How old are they now?

34,10

77. Tom is 4 years older than Jerry. Nine years ago, Tom was 5 times as old as Jerry was then. How old is each now?

Use algebra to solve each challenge. Verify your answer.

78. Kate is 6 years younger than Bill. Twelve years ago, Bill was twice as old as Kate was then. How old are they now?

18,24

79. Martin is twice as old as his son. Twenty years ago, he was 4 times as old as his son was then. How old are they now?

80. Dorothy is 14 years younger than Rita. Ten years ago, Rita was 3 times as old as Dorothy was then. How old is each now?

Challenge #8: George is 7 and his mother is 37. In how many years will his mother be 3 times as old as he is?

8

Use algebra to find each person's age. Verify your answer.

81. George is 7 and his mother is 37. In how many years will his mother be 3 times as old as he is?

STEP 1 George=7→n years from now→7+N
Mother=37→n years from now→37+N
Step 2
(George + n years) times 3
=Mother+n years
Step 3 3(7+N) =37+N
Step 4 21+3N=37+N
2N=16
N=8→ **8 YEARS**

Check your answer→ 3(7+8)=(37+8)☺

8

82. Sam is 35 and Juda is 10. In how many years will Sam be twice as old as Juda?

3,7,14

83. Steve is 5 times as old as Janis. In 12 years, he will be twice as old as she will be then. How old are they now?

84. Sally is 48 and Molly is 35. How many years ago was Sally exactly twice as old as Molly?

85. Pete is 14 and Bill is 54. How many years ago was Bill 6 times as old as Pete?

86. Mary is 4 years older than Toni. Sam is twice as old as Mary. The sum of their 3 ages is 8 times Toni's age. How old are they?

Coin Word Problems Part One

Use an appropriate variable to represent each statement.

87. The value of Q quarters in cents.	88. The value of D dimes in cents.	89. The value of N nickels in cents.
90. The value of Q quarters in dollars.	91. The value of D dimes in dollars.	92. The value of N nickels in dollars.

Using only one variable, write an expression for each statement.

93. There are seven more dimes than nickels. # of dimes= # of nickels=	94. Billy has ten more quarters than pennies. # of quarters= # of pennies=	95. Sarah has 8 times as many dimes as quarters. # of dimes= # of quarters=

Challenge #9: A boy has 7 more dimes than quarters. The total value of the coins is $4.90. Find the number of dimes and quarters.

Use algebra to solve each challenge. Verify your answer.

96. A boy has 7 more dimes than quarters. The total value of the coins is $4.90. Find the number of dimes and quarters.

STEP 1

Coin	Value	# of	Total Val
Dimes	10	Q+7	10Q+70
Quarters	25	Q	25Q

STEP 2
Total value of dimes & quarters=490
STEP 3
(10Q+70)+25Q=490
35Q=420
=12
Quarters=**12** & Dimes=12 + 7=**19**

Check your answer→
(25x12)+(10x19)=490☺

97. Daltan has a total of $4.75 in dimes and nickels. There are 10 more dimes than nickels. Find the number of each

98. Delnique spent $10.60. He used 15 more dimes than quarters. How many dimes did he use?

99. There are 3 more dimes than nickels in a sack of coins. The value of the coins is $8.85. How many nickels are there?

100. There are 15 fewer quarters than dimes in a parking meter. The value of the coins is $13.05. How many dimes are there?

101. Someone found $2.10. If there are 24 fewer nickels than pennies, how many nickels are there?

Use algebra to solve each challenge. Verify your answer.

102. In his coin box, Brian has 12 fewer nickels than dimes. The value of his nickels and dimes is $2.40. How many of each type does he have?

103. Mamatay has quarters and nickels in his pocket. He has ten fewer nickels than quarters, and their total value is $6.10. How many of each does he have?

104. Drakon has 10 more dimes than quarters. He has a total of $15. How many of each does he have?

COIN WORD PROBLEMS PART TWO

Using one variable, write an expression for each of the following.

105. A box is filled with dimes and nickels. There are a total of 20 coins. How many of each is there?

# of dimes=

# of nickels=

106. A box is filled with quarters and nickels. There are a total of 10 coins. How many of each is there?

# of quarters=

# of nickels=

107. A box is filled with pennies and dimes. There are a total of 50 coins. How many of each is there?

# of pennies=

# of dimes=

Challenge #10: A collection of dimes and quarters is worth $15.25. There are 103 coins in all. How many of each is there?

70d, 33q

108. A collection of dimes and quarters is worth $15.25. There are 103 coins in all. How many of each is there?

STEP 1

Coin	Value	# of	Total val
Dimes	10	103-Q	1030-10Q
Quarters	25	Q	25Q

STEP 2

Total value of dimes & quarters=1525

STEP 3

(1030-10Q)+25Q=1525

1030+15Q=1525

15Q=495

Q=**33** & Dimes=103-33=**70**

Check your answer→

(25x103)+(10x70)=1525

109. A collection of nickels and quarters is worth $1.45. There are 13 coins in all. How many of each is there?

110. A collection of half-dollars and quarters is worth $20. There are 51 coins in all. How many of each is there?

Use algebra to solve each challenge. Verify your answer.

111. A collection of half-dollars and nickels is worth $10.70. There are 34 coins in all. How many of each is there?

112. A collection of dimes and nickels is worth $25. There are three times as many nickels as dimes. How many of each is there?

113. A collection of dimes and nickels is worth $4.10. There are 19 more nickels than dimes. How many of each is there?

114. There were 429 people at a play. Admission was $1 for adults and 75cents for children. Receipts were $372.50. How many adults and how many children attended.

115. The attendance at a school concert was 600. Admission was $5 for adults and $2 for children. The receipts were $1500. How many adults and how many children attended?

116. The attendance at a school concert was 220. Admission was $10 for adults and $5 for children. The receipts were $1700. How many adults and how many children attended?

Perimeter Word Problems Part One

Using the same variable, write an expression for each dimension.

117. The width of a rectangle is four more than the length.

Width=

Length=

118. The length of a rectangle is four less than twice the width

Width=

Length=

119. The first side of a triangle is 2cm longer than the second side. The third is two times the length of the first side.

First side=

Second side=

Third side=

Challenge #11: The length of a rectangle is 3 times the width. The perimeter is 96cm. Find the width and length.

12, 36

Challenge #12: The perimeter of a triangle is 76cm. Side a of the triangle is twice as long as side b. Side c is 1 cm longer than side a. Find the length of each side.

15,30,31

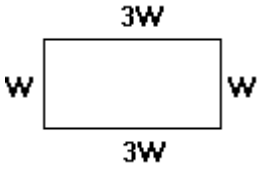
Use algebra to find each length. Verify your answer.

120. The length of a rectangle is 3 times the width. The perimeter is 96cm. Find the width and length.

Possible Strategy.

STEP 1
Width=W
Length=3W

STEP 2



STEP 3
W+3W+W+3W=96
8W=96
W=**12** & Length =3W=**36**
Check your answer→ 12+12+36+36=96☺

121. The length of a rectangle is 5m greater than the width. The perimeter is 150m. Find the width and length.

122. The width of a rectangle is 12 cm less than the length. The perimeter is 156cm. Find the width and length.

35,40

123. The length of a rectangle is 2 cm less than 7 times the width. The perimeter is 60 cm. Find the width and length.

124. A triangular sail has a perimeter of 25m. Side a is 2 m shorter than twice side b, and side c is 3 m longer than side b. Find the length of each side.

125. The first side of a triangle is 8 m shorter than the second side. The 3rd side is 4 times as long as the first side. The perimeter is 26m. Find the length of each side.

Use algebra to find each length. Verify your answer.

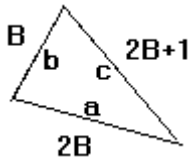
126. The perimeter of a triangle is 76cm. Side a of the triangle is twice as long as side b. Side c is 1 cm longer than side a. Find the length of each side.

Solution:

STEP 1

a=2B
b=B
c=2B+1

STEP 2



STEP 3

a+b+c=76
(2B)+B+(2B+1)=76
5B+1=76
5B=75
b=**15**
a=2(15=**30**
c=2(15)+1=**31**

Check your answer→ 15+30+31=76☺

127. An isosceles triangle has two equal sides. The 3rd side is 30m shorter than twice the length of each congruent side. The perimeter is 570m. Find the length of each side.

128. An isosceles triangle has two equal sides. The 3rd side is 24 m shorter than twice the length of each congruent side. The perimeter is 108m. Find the length of each side.

Perimeter Word Problems Part Two

129. The length of a rectangle is 3cm longer than the width. If the length is increased by 4cm and the width is increased by 8 centimeters write an expression to represent:	130. The length of a rectangle is twice as long as the width. If the length is increased by 3cm and the width is decreased by 5 centimeters write an expression to represent:	131. The length of a rectangle three more than twice the width. If the length is decreased by 4cm and the width is decreased by 2 centimeters write an expression to represent:
Original length=	Original length=	Original length=
Original width=	Original width=	Original width=
Increased length=	Increased length=	Decreased length=
Increased width=	Decreased width=	Decreased width=

Challenge #13: The length of a rectangle is 3 times the width. If the length is decreased by 4 m and the width is increased by 1 m. The perimeter will be 66. Find the dimensions of the original rectangle.

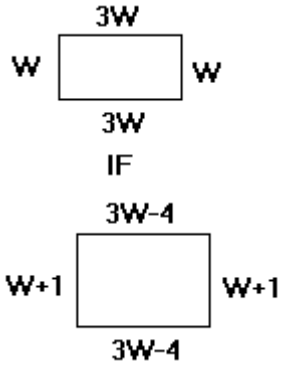
Use algebra to find the length of the each side. Verify your answer.

132. The length of a rectangle is 3 times the width. If the length is decreased by 4 m and the width is increased by 1 m. The perimeter will be 66. Find the dimensions of the original rectangle.

STEP 1

Width=W
Length=3W

STEP 2



STEP 3

8W-6=66
8W=72
W=**9** & Length =3W=**27**

133. The length of a rectangle is 6 cm longer than the width. If the length is increased by 9cm and the width by 5 cm. The perimeter will be 160cm. Find the dimensions of the original rectangle.

134. The length of a rectangle is 7 m less than twice the width. If the length is decreased by 1 m and the width by 4 m, the perimeter will be 66 m. Find the dimensions of the original rectangle.

Challenge #14: The perimeter of a triangle is 69 cm. Side a is 5 cm shorter than side b. Side c is twice as long as side a. Find the length of each side.

Use algebra to solve each challenge. Verify your answer.

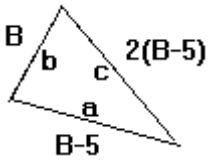
135. The perimeter of a triangle is 69 cm. Side a is 5 cm shorter than side b. Side c is twice as long as side a. Find the length of each side.

Solution:

STEP 1

a=B-5
b=B
c=2(B-5)

STEP 2



STEP 3

a+b+c=69
(B-5)+B+2(B-5)=69
B-5+B+2B-10=69
4B-15=84
B=**21**
A=21-5=**16**
C=**32**

136. The first side of a triangle is 7 cm shorter than twice the second side. The third side is 4 cm longer than the first side. The perimeter is 80 cm. Find the length of each side.

137. The length of a rectangular field is 18 m longer than the width. The field is enclosed with fencing and divided into two parts with a fence parallel to the shorter sides. If 216 m of fencing are required, what are the dimensions of the outside rectangle?

Review Check List

I don't know how to study for math tests!

In general, "A" students are not smarter than "C" students, they just study smarter! ○ Make sure you know how to do all the questions on the quizzes and practice tests. ○ "A" students ask for more help before tests than "C-" students do!	Studying is about finding out what you don't know and doing something about it. ○ Redo every question that is on your tough questions list.	Studying math is not rereading your notes! It is redoing and mastering each type of question prior to the test. ○ Go through each page of the guidebook and redo one question from each section.

Learning Target	Example	Pg #	Face it ☺☹
Each question to the right focuses on the following learning outcomes. • Write a linear equation to represent a given context Solve a given linear equation symbolically. • Solve a given problem using a linear equation and record the process. • Determine, by substitution, whether a given rational number is a solution to a given linear equation.	Jon is 3 years more than twice Mort's age. The sum of their ages is 18. How old is each?	5	
	Find 3 consecutive even numbers such that the sum of the 1st and the 3rd numbers exceeds the 2nd number by 10.	10	
	Jon is 8 years older than his sister. In 3 years, he will be twice as old as she will be then. How old are they now?	12	
	A boy has 7 more dimes than quarters. The total value of the coins is $4.90. Find the number of dimes and quarters.	16	
	A collection of dimes and quarters is worth $15.25. There are 103 coins in all. How many of each is there?	18	
	The length of a rectangle is 3 times the width. The perimeter is 96cm. Find the width and length.	21	
	The length of a rectangle is 3 times the width. If the length is decreased by 4 m and the width is increased by 1 m. The perimeter will be 66. Find the dimensions of the original rectangle.	24	

*Face it. When you have mastered the content draw a ☺ OR if you are unsure, draw a ☹ and ask for help.

Word Problems Practice Test

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- The practice test must be completed prior to writing the test.
- You will lose 5 marks for not completing and correcting the practice test.

1 mark each. Write an algebraic expression to represent

1. 4 more than twice a number.	2. 2 consecutive even numbers.	3. The value of m quarters in dollars.

1 mark each.

4. Max is 7 years older than Jill. The sum of their ages is 41. How old are Max and Jill?	5. Mort is 3 years more than twice Jon's age. The sum of their ages is 18. How old is each?	6. Find 3 consecutive numbers whose sum is 45.
7. Find 3 consecutive odd numbers whose sum is 147.	8. Find 3 consecutive even numbers such that the sum of the 1^{st} and the 3^{rd} numbers exceeds the 2^{nd} number by 10.	9. Al is twice as old as Kate. In 6 years, their ages will total 60. How old is each now?

Use algebra to solve each question.

10. Jon is 8 years older than Sam. In 3 years, he will be twice as old as sam will be then. How old are they now?

11. Kate is 6 years younger than Bill. Twelve years ago, Bill was twice as old as Kate was then. How old are they now?

12. George is 7 and his mother is 37. In how many years will his mother be 3 times as old as he is?

13. A boy has 7 more dimes than quarters. The total value of the coins is $4.90. Find the number of dimes and quarters.

14. A collection of dimes and quarters is worth $15.25. There are 103 coins in all. How many of each coin are there?

15. The length of a rectangle is 3 times the width. The perimeter is 96cm. Find the width and length.

Use algebra to solve each problem.

16. The perimeter of a triangle is 76cm. Side a of the triangle is twice as long as side b. Side c is 1 cm longer than side a. Find the length of each side.

17. The length of a rectangle is 3 times the width. If the length is decreased by 4 m and the width is increased by 1 m. The perimeter will be 66. Find the dimensions of the original rectangle.

18. The perimeter of a triangle is 69 cm. Side a is 5 cm shorter than side b. Side c is twice as long as side a. Find the length of each side.

Answers Key

1. 10 + 3
2. 8 – 5
3. 2(3)
4. 3(4) – 2
5. N + 3
6. N – 5
7. 2N
8. 3N – 2
9. n + 5
10. n + 10
11. n – 6
12. n – 5
13. n + 4
14. 5n
15. 2n
16. $\frac{n}{3}$
17. 6n
18. 3n – 5
19. n,n+1,n+2
20. 5m
21. Malcolm is 7 years older than Timmy.

Solution:
A comparison is being made to Timmy.
If Timmy was 10 then, Malcolm would be 10 +7 =17 years of age. Since we do not know how old Timmy is we will say he is T years old. This would make Malcolm T+7 years old.
Malcolm= T + 7
Timmy=T

22. Mally = T-4
    Tammy = T
23. Mark= 4N
    Nathan= N
24. Newton= 3D
    Desmond= D
25. Marcus= T+2
    Tommy= T

26. Ally = T-6
    Teddy= T
27. Randy= 4B – 2
    Billy= B
28. Vincint= 2B + 3
    Bally= B
29. Dathon= 7J-5
    Jamie= J
30. 17, 24
31. 24, 36
32. 27, 22
33. 21, 13
34. 9, 45
35. 9, 27
36. 5, 13
37. 7, 10
38. 8, 15
39. 22, 17
40. 5, 12
41. 5, 30
42. 3 consecutive numbers

Solution:
An example of three consecutive numbers is 5, 6, & 7. Since we do not know what the first number is, we will call it n. The next number would be n+1 followed by n+1+1
#1=n #2=n+1
#3=n+2

43. 3 consecutive even numbers

Solution:
An example of three consecutive even numbers is 6, 8, & 10. Since we do not know what the first number is we will call it 2n (The 2 makes any integer n even). The next number can be found by adding two.
#1=2n #2=2n+2
#3=2n+4 OR #1=n,
#2=n+2 & #3=n+4 also work

44. 3 consecutive odd numbers

Solution:
An example of three consecutive even numbers is 7, 9, & 11. Since we do not know what the first number is we will call it 2n+1 (The 2 makes any integer n even and adding one makes it odd). The next number can be found by adding two.
#1=2n+1 #2=2n+3 #3=2n+5
OR #1=n, #2=n+2 & #3=n+4 also work

45. 14, 15, 16
46. 12, 13, 14
47. 112, 113, 114
48. 47, 49, 51
49. 50, 52, 54
50. 30,32,34,36
51. 30, 32, 34
52. 331, 333, 335
53. 103, 105, 107
54. A+C =2B
55. 2C+4B=A-8
56. A+B+C=B+52
57. B+C=A-2
58. 2A+4B=A-6
59. A+B=C-4
60. 8,10,12
61. 13,14,15
62. 7,9,11
63. 12,14,16
64. 8,9,10
65. 2,3,4
66. Bill's age now and Bill's age in 6 years.

Solution:
If Bills age now is 10, then his age in 6 years would be 10+6. Since we do not know bills age we will say he is b years old.
Bill's age= b, Bill's age in six years=b+6

67. L, L-7
68. D, D+6
69. 16, 32
70. 15, 38
71. 7,2
72. Sadie is twice Alex's age.

Solution: If Alex is 10 then Sadie would be 20. Writing an equation for that would 20=2(10).
Therefore S=2A.

73. t=M+6
74. M=9H
75. 5, 13
76. 34, 10
77. 10, 14
78. 18,24
79. 30, 60
80. 31, 17
81. 8
82. 15
83. 4, 20
84. 22
85. 6
86. 3, 7, 14
87. The value of Q quarters in cents. Solution: If we had 5 quarters there would 125 cents since 25(5)=125. Since there are Q quarters, there is 25Q cents.
88. 10D
89. 5N
90. The value of Q quarters in cents. Solution: If we had 5 quarters there would $1.25 cents since $0.25(5)=$1.25. Since there are Q quarters, there is $0.25Q.
91. 0.10D
92. 0.05N
93. #dimes= n+7
    #nickels= n
94. #quarters=p+10

#pennies= p
95. #dimes= 8q
#quarters= q
96. 19 dimes, 12 quarters
97. 25 nickels, 35 dimes
98. 41
99. 57
100. 48
101. 31
102. 20d, 8n
103. 22q, 12n
104. 50d, 40q
105. Solution: If there were 8 dimes then there would be 12 nickels since 20-8=12. If there are d dimes then there would be 20-d dimes.
106. q quarters,
10-q nickels
107. p pennies, 50-p dimes
108. 70d, 33q
109. 9n, 4q
110. 22q, 29hd
111. 20hd, 14n
112. 100d, 300n
113. 40n, 21d
114. 226c, 203a
115. 100a, 500c
116. 120a, 100c
117. width= L+4
length= L
118. width = W
length= 2W-4
119. 1st: s+2
2nd: s
3rd: 2(s+2)
120. 12, 36
121. 35, 40
122. 45, 33
123. 4, 26
124. 6, 9, 10
125. 3, 11, 12
126. 15, 30, 31
127. 150,150, 270
128. 42, 33, 33
129. OL= w+3
OW= w
IL= w+7
IW= w+8
130. OL= 2w
OW= w
IL= 2w+3
DW= w-5
131. OL= 2w +3
OW= w
DL= 2w -1
DW= w-2
132. 9, 27
133. 30cm, 36cm
134. 15m,23m
135. 16, 21, 32
136. 18, 29, 33
137. 36, 54

Answer to the practice test.
1. 2m+4
2. 2m, 2m+2
3. 0.25m
4. 17,24
5. 13,5
6. 14,15,16
7. 47,49,51
8. 8,10,12
9. 16,32
10. 5,13
11. 24,18
12. 8
13. 12q, 19d
14. 33q,70d
15. 12w,36l
16. 30,15,31
17. 9m,27m
18. 16,21,32