

ALGEBRA

Lesson 8 Algebra Word Problems

Algebra word problems are often solved by writing an equation that represents the situation, and then solving the equation algebraically. However, algebra word problems with multiple choice answers provided can often be solved by working backwards from the answers. This lesson will focus on solving algebra word problems by using trial and error, working backwards from the multiple choice answers provided.

1. BASIC ALGEBRA WORD PROBLEMS

Example 1

Marion is 4 years older than Pam, and the sum of their ages is 32. How old is Pam?

- A. 12 B. 13 C. 14 D. 15 E. 16

There are two conditions that must be met.

Condition 1: Marion must be 4 years older than Pam.

Condition 2: The sum of the two ages must be 32.

The question is: How old is Pam?

Each multiple choice answer – 12, 13, 14, 15, 16 – is a possible answer to that question.

Step 1. Start with 12, the first possible age for Pam.

Step 2. Think: what else can you figure out once you know Pam's age? We know Marion is 4 years older than Pam, so if Pam is 12, Marion must be $12 + 4 = 16$.

Step 3. Now we know the two ages, so how do we test to see if they are the right ages for this problem? The problem tells us that the sum of the ages is 32, so add the two ages together, and see if their sum is 32. $12 + 16 = 28$
This does not meet the second condition of this problem, so the number we started with, Pam's age = 12, is not correct.

Step 4. Repeat with each multiple choice answer until the sum of the two ages is 32.

It usually helps to set up a chart.

<u>If Pam Is</u>	<u>Then Marion Is</u>	<u>Is Sum Of Ages 32?</u>	
From Answers	Pam's Age + 4	Pam's age + Marion's Age	
A. 12	$12 + 4 = 16$	$12 + 16 = 28$	Not 32, so Pam can't be 12.
B. 13	$13 + 4 = 17$	$13 + 17 = 30$	Not 32, so Pam can't be 13.
C. 14	$14 + 4 = 18$	$14 + 18 = 32$	Equals 32, so Pam is 14.

Answer: C. 14

IMPORTANT – Do you start with Pam or Marion? The problem asks: How old is Pam? So, start there. Always start with the answer to the question that the problem asks.

Example 2

The Smiths and Garcias purchased Christmas presents and together spent a total of \$580. If the Garcias spent \$110 more than the Smiths, how much did the Smiths spend?

- A. \$200 B. \$250 C. \$235 D. \$300 E. \$350

The question asked is: How much did the Smiths spend? Each multiple choice \$ amount is a possible answer to that question, so start there, with how much the Smiths spent.

Step 1. Start with \$200, the first possible amount the Smiths spent.

Step 2. Think: what else can you figure out once you know how much the Smiths spent? We know the Garcias spent \$110 more than the Smiths, so if the Smiths spent \$200, the Garcias spent $\$200 + \$110 = \$310$

Step 3. Now we know how much each family spent, so how do we test to see if they are the right amounts for this problem? The problem tells us that the total spent by the two families together is \$580, so add the two amounts together, and see if they add up to \$580. $\$200 + \$310 = \$510$

This does not meet the condition of this problem, so the number we started with, Smiths spent \$200, is not correct.

Step 4. Repeat with each multiple choice answer until the amount spent by both families together is \$580.

It will be helpful to set up a chart.

<u>If Smiths Spent</u> From Answers	<u>Then Garcias Spent</u> \$ Smiths Spent + \$110	<u>Is Total \$580?</u> Smiths \$ + Garcias \$	
A. \$200	$\$200 + \$110 = \$310$	$\$200 + \$310 = \$510$	Not \$580, so \$200 is not correct.
B. \$250	$\$250 + \$110 = \$360$	$\$250 + \$360 = \$610$	Not \$580, so \$250 is not correct.
C. \$235	$\$235 + \$110 = \$345$	$\$235 + \$345 = \$580$	Is \$580, so \$235 is correct.

Answer: C. \$235

IMPORTANT – Do you start with the Smiths or the Garcias? The problem asks: How much did the Smiths spend? So, start there. Always start with the answer to the question that the problem asks.

Example 3

The sum of two numbers is 98. If one number is six times as big as the other number, what are the two numbers?

- A. 10 & 88 B. 10 & 60 C. 12 & 86 D. 14 & 84 E. 12 & 72

In this problem you are asked for two numbers, and the pair of numbers must meet two tests.

Test one: They must add up to 98.

Test two: One number must be 6 times as big as the other number.

Set up a chart, and test both conditions for each pair of numbers, until you find the pair of numbers that meets both conditions.

	<u>Add Up To 98?</u> Add the Two Numbers	<u>Is One Number 6 Times As Big As The Other Number?</u> Does Small Number x 6 = Big Number?
A. 10 & 88	Yes	No, 10×6 does not equal 88.
B. 10 & 60	No	Don't need to check since first test failed.
C. 12 & 86	Yes	No, 12×6 does not equal 86.
D. 14 & 84	Yes	Yes, 14×6 does equal 84.

Answer: D. 14 & 84

Example 4

The product of two numbers is 1,125 and one number is 5 times the other number. What is the smaller number?

- A. 8 B. 10 C. 12 D. 15 E. 20

NOTE – The product of two numbers is the result you get when you multiply the two numbers.

The question asked is: What is the smaller number? The multiple choice answers are possible answers to that question, so start there, with the smaller number.

	<u>If Small Number Is</u> From Answers	<u>Then Big Number Is</u> $5 \times$ Small Number	<u>Is Product 1,125?</u> Small Number x Big Number
A.	8	$8 \times 5 = 40$	$8 \times 40 = 320$ Product too small.
B.	10	$10 \times 5 = 50$	$10 \times 50 = 500$ Product too small.
C.	12	$12 \times 5 = 60$	$12 \times 60 = 720$ Product too small.
D.	15	$15 \times 5 = 75$	$15 \times 75 = 1,125$ Product is correct.

Answer: D. 15

IMPORTANT – Do you start with the small number or the big number? The question asks: What is the smaller number? So, start there. Always start with the answer to the question that the problem asks.

Example 5

Don, Tre, and Lou had a yard sale and together made a total of \$510. If Tre sold twice as much as Don, and Lou sold \$40 less than Tre, how much did Don sell?

- A. \$80 B. \$95 C. \$125 D. \$110 E. \$75

The question is: How much did Don sell? The multiple choice answers are possible answers to that question, so start there, with how much Don sold.

Step 1. Start with \$80, the first possible amount that Don sold.

Step 2. Think: What else can you figure out once you know how much Don sold? We know that Tre sold twice as much as Don, so if Don sold \$80, then Tre sold $2 \times \$80 = \160 .

Step 3. Think: We know how much Don and Tre each sold, so how do we figure out how much Lou sold? The problem tells us that Lou sold \$40 less than Tre, so if Tre sold \$160, then Lou sold $\$160 - \$40 = \$120$

Step 4. Now we know how much each person sold, so how do we test to see if they are the right amounts for this problem? The problem tells us that the total amount sold was \$510, so add the three amounts together, and see if they add up to \$510.
 $\$80 + \$160 + \$120 = \360 This does not meet the condition of this problem, so the number we started with, Don sold \$80, is not correct.

Step 5. Repeat with each multiple choice answer until the total sold is \$510.

	<u>If Don Sold</u> From Answers	<u>Then Tre Sold</u> 2 x What Don Sold	<u>And Then Lou Sold</u> \$40 Less Than Tre	<u>Is Total \$510?</u> Don \$ + Tre \$ + Lou \$
A.	\$80	$2 \times \$80 = \160	$\$160 - \$40 = \$120$	$\$80 + \$160 + \$120 = \360
B.	\$95	$2 \times \$95 = \190	$\$190 - \$40 = \$150$	$\$95 + \$190 + \$150 = \435
C.	\$125	$2 \times \$125 = \250	$\$250 - \$40 = \$210$	$\$125 + \$250 + \$210 = \585
D.	\$110	$2 \times \$110 = \220	$\$220 - \$40 = \$180$	$\$110 + \$220 + \$180 = \510

Answer: D. \$110

Practice One Answers – p. 11

1. Lisa and Ayana spent a total of \$978 at the mall, and Lisa spent \$128 more than Ayana. How much did Ayana spend?

- A. \$850 B. \$1,106 C. \$425 D. \$452 E. \$805

2. A father is 6 times as old as his son, and together their ages total 63 years. How old is the son?

- A. 57 B. 10 C. 70 D. 9 E. 8

3. A man ate a total of 5,995 calories over a two day nutrition study. If he ate 325 more calories the first day than he ate on the second day, how many calories did he eat on the first day?
- A. 3,200 B. 3,160 C. 2,950 D. 2,835 E. 2,550
4. The product of two numbers is 576 and one number is 4 times the other number. What is the smaller number?
- A. 8 B. 9 C. 10 D. 11 E. 12
5. The sum of three consecutive whole numbers is 177. What is the smallest of the three numbers?
- A. 45 B. 60 C. 50 D. 58 E. 55
6. A jewelry craftsperson is bringing 204 pieces of jewelry to sell at a festival. If she has 12 more necklaces than bracelets and twice as many rings as necklaces, how many bracelets does she have?
- A. 35 B. 40 C. 42 D. 50 E. 55
7. A thrift shop has 50 more cds than books, and 3 times as many dvds as cds. If the total number of books, cds, and dvds is 1,435 how many books are at the thrift shop?
- A. 150 B. 197 C. 225 D. 247 E. 315
8. A bakery sold a total of 265 cookies in one day. If the number of chocolate chip cookies sold was 65 less than 2 times the number of cranberry cookies sold, how many cranberry cookies were sold?
- A. 200 B. 135 C. 110 D. 95 E. 80
9. If the sum of three consecutive odd whole numbers is 681, what is the largest of the three numbers?
- A. 199 B. 185 C. 221 D. 225 E. 229

2. MORE COMPLICATED ALGEBRA WORD PROBLEMS

Example 1

A company has to haul 24 tons of material using its small truck, which carries 1.5 tons, and its large truck, which carries 5 tons. If the small truck makes twice as many runs as the large truck, how many large truck runs were made?

- A. 4 B. 2 C. 5 D. 3 E. 24

The question is: How many large truck runs were made? The multiple choice answers are possible answers to that question, so start there, with the number of large truck runs. A chart will be very helpful, and you can also read through the steps shown below the chart.

	<u>Large Truck Runs</u>	<u>Tons From Large Trucks</u>	<u>Small Truck Runs</u>	<u>Tons From Small Trucks</u>	<u>Total Tons = 24?</u>
	From Answers	# of Large Runs x 5	# of Large Runs x 2	# of Small Runs x 1.5	Large Tons + Small Tons
A.	4	$4 \times 5 = 20$	$2 \times 4 = 8$	$8 \times 1.5 = 12$	$20 + 12 = 32$
B.	2	$2 \times 5 = 10$	$2 \times 2 = 4$	$4 \times 1.5 = 6$	$10 + 6 = 16$
C.	5	$5 \times 5 = 25$	$2 \times 5 = 10$	$10 \times 1.5 = 15$	$25 + 15 = 40$
D.	3	$3 \times 5 = 15$	$2 \times 3 = 6$	$6 \times 1.5 = 9$	$15 + 9 = 24$

Answer: D. 3

Step 1. Start with 4, the first possible number of large truck runs.

Step 2. Think: If you know the number of large truck runs what else can you figure out? The total tons carried by large trucks is the number of large truck runs times tons carried in each large truck run.
 $4 \text{ runs} \times 5 \text{ tons each run} = 20 \text{ tons carried by large trucks.}$

Step 3. If you know the number of large truck runs, you can also figure out the number of small truck runs by multiplying times 2, because the problem tells you that the small truck makes twice as many runs as the large truck.
 $2 \times 4 \text{ large truck runs} = 8 \text{ small truck runs.}$

Step 4. Now you can figure out the total tons carried by small trucks. This is the number of small truck runs times the tons carried in each small truck run.
 $8 \text{ runs} \times 1.5 \text{ tons each run} = 12 \text{ tons carried by small trucks.}$

Step 5. Now we know how many tons were carried by the large truck runs and how many were carried by the small truck runs, so how do we test to see if they are the right amounts for this problem?
 The problem tells us that the total tons carried was 24, so add the tons together, and see if they add up to 24.
 $20 \text{ tons from large trucks} + 12 \text{ tons from small trucks} = 32 \text{ total tons.}$
 This does not meet the condition of the problem, so the number we started with, 4 large truck runs, is not correct.

Step 6. Repeat with each multiple choice answer until the total tons = 24.

Example 2

A teacher spent \$520 on math and reading workbooks, and she bought twice as many math workbooks as reading workbooks. If math workbooks cost \$5 each and reading workbooks cost \$3 each, how many reading workbooks did she buy?

- A. 30 B. 35 C. 40 D. 45 E. 50

The question is: How many reading workbooks did she buy? The multiple choice answers are possible answers to that question, so start there, with the number of reading workbooks.

	<u># of Reading Workbooks</u>	<u>Cost of Rdg. Workbooks</u>	<u># of Math Workbooks</u>	<u>Cost of Math Workbooks</u>	<u>Total Cost of All Workbooks</u>
	From Answers	# Rdg Wkbs x \$3	# Rdg Wkbs x 2	# Math Wkbs x \$5	Cost of Rdg + Cost of Math
A.	30	$30 \times \$3 = \90	$30 \times 2 = 60$	$60 \times \$5 = \300	$\$90 + \$300 = \$390$
B.	35	$35 \times \$3 = \105	$35 \times 2 = 70$	$70 \times \$5 = \350	$\$105 + \$350 = \$455$
C.	40	$40 \times \$3 = \120	$40 \times 2 = 80$	$80 \times \$5 = \400	$\$120 + \$400 = \$520$

Answer: C. 40

Step 1. Start with 30, the first possible number of reading workbooks.

Step 2. Calculate the cost of all reading workbooks. $30 \times \$3 = \90

Step 3. Calculate number of math workbooks, which is 2 times the number of reading workbooks. $30 \times 2 = 60$

Step 4. Calculate the cost of all math workbooks. $60 \times \$5 = \300

Step 5. Calculate the total cost of all the workbooks and see if it adds up to \$520.
 $\$90 + \$300 = \$390$ Not \$520, so the number we started with, 30 reading workbooks is not correct.

Step 6. Repeat with each multiple choice answer until the total cost of workbooks = \$520

Example 3

Weekly payroll for an accounting department is \$98,100. If there are 3 supervisors and 200 clerks, and a clerk make \$220 per week less than a supervisor, how much does each supervisor make per week? (All clerks have the same salary, and all supervisors' salaries are the same.)

- A. \$1,200 B. \$1,100 C. \$900 D. \$800 E. \$700

The question is: How much does each supervisor make per week? The multiple choice answers are possible answers to that question, so start there, with the supervisor salary.

<u>Salary of 1 Supervisor</u> From Answers	<u>Salary of All Supervisors</u> 3 x Sal. of 1 Super.	<u>Salary of 1 Clerk</u> Super. Sal. - \$220	<u>Salary of All Clerks</u> 200 x Sal. of 1 Clerk	<u>Does Weekly Payroll = \$98,100?</u> All Super. + All Clerks
A. \$1,200	3 x \$1,200 = \$3,600	\$1,200 - \$220 = \$980	\$980 x 200 = \$196,000	\$3,600 + \$196,000 = \$199,600
B. \$1,100	answer A was way too big, so maybe skip B. and try C. D. or E.			
C. \$900	3 x \$900 = \$2,700	\$900 - \$220 = \$680	\$680 x 200 = \$136,000	\$2,700 + \$136,000 = \$138,700
D. \$800	3 x \$800 = \$2,400	\$800 - \$220 = \$580	\$580 x 200 = \$116,000	\$2,400 + \$116,000 = \$118,400
E. \$700	3 x \$700 = \$2,100	\$700 - \$220 = \$480	\$480 x 200 = \$96,000	\$2,100 + \$96,000 = \$98,100

Answer: E. \$700

Step 1. Start with \$1,200, the first possible supervisor salary.

Step 2. Calculate total salary of all supervisors. $\$1,200 \times 3 = \$3,600$

Step 3. Calculate clerk salary, which is \$220 less than supervisor salary.
 $\$1,200 - \$220 = \$980$.

Step 4. Calculate total salary of all clerks. $\$980 \times 200 = \$196,000$

Step 5. Calculate total payroll of all clerks plus all supervisors and see if it adds up to \$98,100. $\$3,600 + \$196,000 = \$199,600$

This does not meet the condition of the problem, so the number we started with, \$1,200 supervisor salary, is not correct.

Step 6. Repeat with each multiple choice answer until the total payroll = \$98,100.

Practice Two Answers – p. 14

1. A jeweler spent \$510 on gold and silver beads. Gold beads cost \$9 each, and silver beads cost \$2 each. If he bought 4 times as many silver beads as gold beads, how many gold beads did he buy?
A. 20 B. 25 C. 40 D. 30 E. 45
2. A bag of coins has twice as many quarters as nickels, and the total value of all the coins is \$47.30. How many nickels are in the bag?
A. 75 B. 76 C. 80 D. 85 E. 86
3. A craftsperson worked for 70 hours to fill an order for silk flower bouquets, and it takes 2 hours to make a simple bouquet, and 5 hours to make a fancy bouquet. If she made 14 more simple bouquets than fancy bouquets, how many fancy bouquets did she make?
A. 4 B. 5 C. 6 D. 7 E. 8
4. The Premier Chocolate Assortment has a wholesale price that is three times as much as the wholesale price of the Deluxe Chocolate Assortment. If a store spent \$416 to buy 45 Premier and 125 Deluxe, what is the wholesale price of the Deluxe Assortment?
A. \$2.00 B. \$2.40 C. \$1.20 D. \$1.60 E. \$1.75
5. A total of 900 concert tickets were sold. Some were Stage tickets, priced at \$15, and the rest were Balcony tickets, priced at \$10. If the total proceeds from the ticket sales were \$11,900 how many Balcony tickets were sold?
A. 60 B. 90 C. 150 D. 300 E. 320
6. A decorative tile panel will cover 600 in^2 , and will be made of blue tiles that each cover 9 in^2 , and white tiles that each cover 12 in^2 . If there are twice as many blue tiles as white tiles, how many white tiles are in the panel?
A. 30 B. 20 C. 15 D. 22 E. 40

Challenger One Answer – p. 17

A restaurant buys 4 times as many pounds of onions as carrots in their weekly order from a supplier. Carrots cost \$0.44 less per pound than onions, which cost \$1.16 per pound. If the bill for this weekly order is \$348.40, how many pounds of onions were bought?

- A. 180 B. 220 C. 260 D. 300 E. 340

Challenger Two Answer – p. 18

An art project requires three different size tiles, and covers a total of 992 in². The small tiles each cover 4 in², the medium tiles each cover 8 in², and the large tiles each cover 12 in². If there are 3 times as many small as medium tiles, and the number of large tiles is 64 less than 2 times the number of medium tiles, how many small tiles are there?

- A. 102 B. 114 C. 120 D. 138 E. 144

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ANSWER KEY Lesson 8 Algebra Word Problems

Practice One

1. Lisa and Ayana spent a total of \$978 at the mall, and Lisa spent \$128 more than Ayana. How much did Ayana spend?

- A. \$850 B. \$1,106 C. \$425 D. \$452 E. \$805

The multiple choice answers are possible amounts that Ayana spent, so start there.

<u>If Ayana Spent</u> From Answers	<u>Then Lisa Spent</u> Amount Ayana Spent + \$128	<u>Is Total \$978?</u> Ayana \$ + Lisa \$
A. \$850	$\$850 + \$128 = \$978$	$\$850 + \$978 = \$1,828$
B. \$1,106	$\$1,106 + \$128 = \$1,234$	$\$1,106 + \$1,234 = \$2,340$
C. \$425	$\$425 + \$128 = \$553$	$\$425 + \$553 = \$978$

Answer: C. \$425

2. A father is 6 times as old as his son, and together their ages total 63 years. How old is the son?

- A. 57 B. 10 C. 70 D. 9 E. 8

The multiple choice answers are possible ages of the son, so start there.

<u>If Son Is</u> From Answers	<u>Then Father Is</u> Son's Age x 6	<u>Is Total 63 Years?</u> Son's Age + Father's Age
A. 57	$57 \times 6 = 342$	$57 + 342 = 399$ Way too big.
B. 10	$10 \times 6 = 60$	$10 + 60 = 70$ Close to 63, but still too big.
C. 70	57 was way too big, so probably don't need to check 70	
D. 9	$9 \times 6 = 54$	$9 + 54 = 63$ Total is correct.

Answer: D. 9

3. A man ate a total of 5,995 calories over a two day nutrition study. If he ate 325 more calories the first day than he ate on the second day, how many calories did he eat on the first day?

- A. 3,200 B. 3,160 C. 2,950 D. 2,835 E. 2,550

The multiple choice answers are possible number of calories eaten the first day, so start there.

<u>If First Day Calories =</u> From Answers	<u>Then Second Day Calories =</u> First Day Calories – 325 Calories	<u>Is Total 5,995?</u> 1 st Day Cal. + 2 nd Day Cal.
A. 3,200	$3,200 - 325 = 2,875$	$3,200 + 2,875 = 6,075$
B. 3,160	$3,160 - 325 = 2,835$	$3,160 + 2,835 = 5,995$

Answer: B. 3,160

4. The product of two numbers is 576 and one number is 4 times the other number. What is the smaller number?

- A. 8 B. 9 C. 10 D. 11 E. 12

The multiple choice answers are possible values of the smaller number, so start there.

	<u>If Small Number Is</u> From Answers	<u>Then Big Number Is</u> 4 x Small Number	<u>Is Product 576?</u> Small x Big
A.	8	$8 \times 4 = 32$	$8 \times 32 = 256$
B.	9	$9 \times 4 = 36$	$9 \times 36 = 324$
C.	10	$10 \times 4 = 40$	$10 \times 40 = 400$
D.	11	$11 \times 4 = 44$	$11 \times 44 = 484$
E.	12	$12 \times 4 = 48$	$12 \times 48 = 576$

Answer: E. 12

5. A bakery sold a total of 265 cookies in one day. If the number of chocolate chip cookies sold was 65 less than 2 times the number of cranberry cookies sold, how many cranberry cookies were sold?

- A. 200 B. 135 C. 110 D. 95 E. 80

The multiple choice answers are possible number of cranberry cookies, so start there.

	<u>If Cranberry Is</u> From Answers	<u>Then Chocolate Chip Is</u> # of Cran. x 2, Then Subtract 65	<u>Is Total 265?</u> # of Cran. + # of Choc. Chip
A.	200	$(2 \times 200) - 65 = 335$	$200 + 335 = 535$
B.	135	$(2 \times 135) - 65 = 205$	$135 + 205 = 340$
C.	110	$(2 \times 110) - 65 = 155$	$110 + 155 = 265$

Answer: C. 110

NOTE – The symbol # is a shorthand way of saying number, so “# of Cran.” means Number of Cran.

6. A jewelry craftsperson is bringing 204 pieces of jewelry to sell at a festival. If she has 12 more necklaces than bracelets and twice as many rings as necklaces, how many bracelets does she have?

- A. 35 B. 40 C. 42 D. 50 E. 55

The multiple choice answers are possible number of bracelets, so start there.

	<u>If Bracelets =</u> From Answers	<u>Then Necklaces =</u> # of Bracelets + 12	<u>And Then Rings =</u> # of Necklaces x 2	<u>Is Total 204?</u> Brace. + Neck. + Rings
A.	35	$35 + 12 = 47$	$2 \times 47 = 94$	$35 + 47 + 94 = 176$
B.	40	$40 + 12 = 52$	$2 \times 52 = 104$	$40 + 52 + 104 = 196$
C.	42	$42 + 12 = 54$	$2 \times 54 = 108$	$42 + 54 + 108 = 204$

Answer: C. 42

7. The sum of three consecutive whole numbers is 177. What is the smallest of the three numbers?

- A. 45 B. 60 C. 50 D. 58 E. 55

NOTE – Consecutive means following one after the other without skipping any numbers. For example, 5, 6, 7 or 66, 67, 68. Move from one consecutive number to the next consecutive number by adding or subtracting 1.

The multiple choice answers are possibilities for the smallest number, so start there.

	<u>If The Smallest Number Is</u> From Answers	<u>Then The Middle Number Is</u> Smallest + 1	<u>And Then The Largest Number Is</u> Add 1 Again	<u>Is Total 177?</u> Small + Middle + Large
A.	45	46	47	$45 + 46 + 47 = 138$
B.	60	61	62	$60 + 61 + 62 = 183$
C.	50	51	52	$50 + 51 + 52 = 153$
D.	58	59	60	$58 + 59 + 60 = 177$

Answer: D. 58

8. A thrift shop has 50 more cds than books, and 3 times as many dvds as cds. If the total number of books, cds, and dvds is 1,435 how many books are at the thrift shop?

- A. 150 B. 197 C. 225 D. 247 E. 315

The multiple choice answers are possible number of books, so start there.

	<u>If Books =</u> From Answers	<u>Then CDs =</u> # of Books + 50	<u>And Then DVDs =</u> # of CDs x 3	<u>Is Total 1,435?</u> Books + CDs + DVDs
A.	150	$150 + 50 = 200$	$3 \times 200 = 600$	$150 + 200 + 600 = 950$
B.	197	$197 + 50 = 247$	$3 \times 247 = 741$	$197 + 247 + 741 = 1,185$
C.	225	$225 + 50 = 275$	$3 \times 275 = 825$	$225 + 275 + 825 = 1,325$
D.	247	$247 + 50 = 297$	$3 \times 297 = 891$	$247 + 297 + 891 = 1,435$

Answer: D. 247

9. If the sum of three consecutive odd whole numbers is 681, what is the largest of the three numbers?

- A. 199 B. 185 C. 221 D. 225 E. 229

The multiple choice answers are possibilities for the largest number, so start there.

CAREFUL – These are consecutive **odd** numbers, like 29, 31, 33. They are odd numbers only, following one after the other without skipping any odd numbers. Move from one consecutive odd number to the next consecutive odd number by adding or subtracting 2.

	<u>If The Largest Number Is</u> From Answers	<u>Then The Middle Number Is</u> Largest Number – 2	<u>And Then The Smallest Number Is</u> Middle Number – 2	<u>Is Total 681?</u> Large + Middle + Small
A.	199	197	195	$199 + 197 + 195 = 591$
B.	185	183	181	$185 + 183 + 181 = 549$
C.	221	219	217	$221 + 219 + 217 = 657$
D.	225	223	221	$225 + 223 + 221 = 669$
E.	229	227	225	$229 + 227 + 225 = 681$

Answer: E. 229

Practice Two

1. A jeweler spent \$510 on gold and silver beads. Gold beads cost \$9 each, and silver beads cost \$2 each. If he bought 4 times as many silver beads as gold beads, how many gold beads did he buy?

- A. 20 B. 25 C. 40 D. 30 E. 45

The multiple choice answers are possible number of gold beads, so start there.

	<u># of Gold Beads</u> From Answers	<u>Cost of Gold Beads</u> # of Gold x \$9	<u># of Silver Beads</u> # of Gold x 4	<u>Cost of Silver Beads</u> # of Silver x \$2	<u>Is Total \$510?</u> Gold \$ + Silver \$
A.	20	$20 \times \$9 = \180	$20 \times 4 = 80$	$80 \times \$2 = \160	$\$180 + \$160 = \$340$
B.	25	$25 \times \$9 = \225	$25 \times 4 = 100$	$100 \times \$2 = \200	$\$225 + \$200 = \$425$
C.	40	$40 \times \$9 = \360	$40 \times 4 = 160$	$160 \times \$2 = \320	$\$360 + \$320 = \$680$
D.	30	$30 \times \$9 = \270	$30 \times 4 = 120$	$120 \times \$2 = \240	$\$270 + \$240 = \$510$

Answer: D. 30

2. A bag of coins has twice as many quarters as nickels, and the total value of all the coins is \$47.30. How many nickels are in the bag?

- A. 75 B. 76 C. 80 D. 85 E. 86

The multiple choice answers are possible number of nickels, so start there.

<u>Number of Nickels</u>	<u>Value of Nickels</u>	<u>Number of Quarters</u>	<u>Value of Quarters</u>	<u>Is Total \$47.30?</u>
From Answers	# of Nickels x \$0.05	# of Nickels x 2	# of Quarters x \$0.25	Nickels \$ + Quarters \$
A. 75	75 x \$0.05 = \$3.75	75 x 2 = 150	150 x \$0.25 = \$37.50	\$3.75 + \$37.50 = \$41.25
B. 76	76 x \$0.05 = \$3.80	76 x 2 = 152	152 x \$0.25 = \$38.00	\$3.80 + \$38.00 = \$41.80
C. 80	80 x \$0.05 = \$4.00	80 x 2 = 160	160 x \$0.25 = \$40.00	\$4.00 + \$40.00 = \$44.00
D. 85	85 x \$0.05 = \$4.25	85 x 2 = 170	170 x \$0.25 = \$42.50	\$4.25 + \$42.50 = \$46.75
E. 86	86 x \$0.05 = \$4.30	86 x 2 = 172	172 x \$0.25 = \$43.00	\$4.30 + \$43.00 = \$47.30

Answer: E. 86

3. A craftsperson worked for 70 hours to fill an order for silk flower bouquets, and it takes 2 hours to make a simple bouquet, and 5 hours to make a fancy bouquet. If she made 14 more simple bouquets than fancy bouquets, how many fancy bouquets did she make?

- A. 4 B. 5 C. 6 D. 7 E. 8

The multiple choice answers are possible number of fancy bouquets made, so start there.

<u># of Fancy</u>	<u>Time on Fancy</u>	<u># of Simple</u>	<u>Time on Simple</u>	<u>Is Total Time 70 Hours?</u>
From Answers	# of Fancy x 5 Hours	# of Fancy + 14	# of Simple x 2 Hours	Fancy Hrs + Simple Hrs
A. 4	4 x 5 = 20	4 + 14 = 18	18 x 2 = 36	20 + 36 = 56
B. 5	5 x 5 = 25	5 + 14 = 19	19 x 2 = 38	25 + 38 = 63
C. 6	6 x 5 = 30	6 + 14 = 20	20 x 2 = 40	30 + 40 = 70

Answer: C. 6

4. The Premier Chocolate Assortment has a wholesale price that is three times as much as the wholesale price of the Deluxe Chocolate Assortment. If a store spent \$416 to buy 45 Premier and 125 Deluxe, what is the wholesale price of the Deluxe Assortment?

- A. \$2.00 B. \$2.40 C. \$1.20 D. \$1.60 E. \$1.75

The multiple choice answers are possible wholesale prices of the Deluxe Assortment, so start there.

<u>Price of Each Deluxe</u> From Answers	<u>Price of All Deluxe</u> 125 x Price of Each Deluxe	<u>Price of Each Premier</u> Price of Each Deluxe x 3	<u>Price of All Premier</u> 45 x Price of Each Premier	<u>Is Total Price \$416?</u> All Deluxe + All Premier
A. \$2.00	$2.00 \times 125 = \$250$	$3 \times 2.00 = \$6.00$	$6.00 \times 45 = \$270$	$250 + 270 = \$520$
B. \$2.40	$2.40 \times 125 = \$300$	$3 \times 2.40 = \$7.20$	$7.20 \times 45 = \$324$	$300 + 324 = \$624$
C. \$1.20	$1.20 \times 125 = \$150$	$3 \times 1.20 = \$3.60$	$3.60 \times 45 = \$162$	$150 + 162 = \$312$
D. \$1.60	$1.60 \times 125 = \$200$	$3 \times 1.60 = \$4.80$	$4.80 \times 45 = \$216$	$200 + 216 = \$416$

Answer: D. \$1.60

5. A total of 900 concert tickets were sold. Some were Stage tickets, priced at \$15, and the rest were Balcony tickets, priced at \$10. If the total proceeds from the ticket sales were \$11,900 how many Balcony tickets were sold?

- A. 60 B. 90 C. 150 D. 300 E. 320

The multiple choice answers are possible number of Balcony tickets, so start there.

<u>Number of Balcony Tickets</u> From Answers	<u>Cost of All Balcony Tickets</u> # of Balcony x \$10	<u>Number of Stage Tickets</u> Total – Balcony	<u>Cost of All Stage Tickets</u> # of Stage x \$15	<u>Is Total Cost \$11,900?</u> Balcony Cost + Stage Cost
A. 60	$60 \times \$10 = \600	$900 - 60 = 840$	$840 \times \$15 = \$12,600$	$600 + \$12,600 = \$13,200$
B. 90	$90 \times \$10 = \900	$900 - 90 = 810$	$810 \times \$15 = \$12,150$	$900 + \$12,150 = \$13,050$
C. 150	$150 \times \$10 = \$1,500$	$900 - 150 = 750$	$750 \times \$15 = \$11,250$	$1,500 + \$11,250 = \$12,750$
D. 300	$300 \times \$10 = \$3,000$	$900 - 300 = 600$	$600 \times \$15 = \$9,000$	$3,000 + \$9,000 = \$12,000$
E. 320	$320 \times \$10 = \$3,200$	$900 - 320 = 580$	$580 \times \$15 = \$8,700$	$3,200 + \$8,700 = \$11,900$

Answer: E. 320

6. A decorative tile panel will cover 600 in^2 , and will be made of blue tiles that each cover 9 in^2 , and white tiles that each cover 12 in^2 . If there are twice as many blue tiles as white tiles, how many white tiles are in the panel?

- A. 30 B. 20 C. 15 D. 22 E. 40

The multiple choice answers are possible number of white tiles, so start there.

<u>Number of White</u>	<u>In² Covered by White</u>	<u>Number of Blue</u>	<u>In² Covered by Blue</u>	<u>Is Total 600 In² ?</u>
From Answers	# of White x 12 in^2	# of White x 2	# of Blue x 9 in^2	White In ² + Blue In ²
A. 30	$30 \times 12 \text{ in}^2 = 360 \text{ in}^2$	$30 \times 2 = 60$	$60 \times 9 \text{ in}^2 = 540 \text{ in}^2$	$360 \text{ in}^2 + 540 \text{ in}^2 = 900 \text{ in}^2$
B. 20	$20 \times 12 \text{ in}^2 = 240 \text{ in}^2$	$20 \times 2 = 40$	$40 \times 9 \text{ in}^2 = 360 \text{ in}^2$	$240 \text{ in}^2 + 360 \text{ in}^2 = 600 \text{ in}^2$

Answer: B. 20

Challenger One

A restaurant buys 4 times as many pounds of onions as carrots in their weekly order from a supplier. Carrots cost $\$0.44$ less per pound than onions, which cost $\$1.16$ per pound. If the bill for this weekly order is $\$348.40$, how many pounds of onions were bought?

- A. 180 B. 220 C. 260 D. 300 E. 340

The multiple choice answers are possible number of pounds of onions, so start there.

NOTE – the multiple choice answers you are testing are quantity of onions. Since there are 4 times as many onions as carrots, to get the quantity of carrots, multiply times $\frac{1}{4}$ or divide by 4.

NOTE – The per pound cost of carrots is not given. Use information that is given to subtract $\$1.16 - \$0.44 = \$0.72$.

<u>Pounds of Onions</u>	<u>Cost of All Onions</u>	<u>Pounds of Carrots</u>	<u>Cost of All Carrots</u>	<u>Is Total Cost \$348.40?</u>
From Answers	Pounds of Onions x $\$1.16$	Pounds of Onions x $\frac{1}{4}$	Pounds of Carrots x Cost of Carrots	Cost of Onions + Cost of Carrots
A. 180	$180 \times \$1.16 = \208.80	$\frac{1}{4} \times 180 = 45$	$45 \times \$0.72 = \32.40	$\$208.80 + \$32.40 = \$241.20$
B. 220	$220 \times \$1.16 = \255.20	$\frac{1}{4} \times 220 = 55$	$55 \times \$0.72 = \39.60	$\$255.20 + \$39.60 = \$294.80$
C. 260	$260 \times \$1.16 = \301.60	$\frac{1}{4} \times 260 = 65$	$65 \times \$0.72 = \46.80	$\$301.60 + \$46.80 = \$348.40$

Answer: C. 260

Challenger Two

An art project requires three different size tiles, and covers a total of 992 in^2 . The small tiles each cover 4 in^2 , the medium tiles each cover 8 in^2 , and the large tiles each cover 12 in^2 . If there are 3 times as many small as medium tiles, and the number of large tiles is 64 less than 2 times the number of medium tiles, how many small tiles are there?

- A. 102 B. 114 C. 120 D. 138 E. 144

The multiple choice answers are possible number of small tiles, so start there.

<u>Number of Small Tiles</u>	<u>Area Covered by Small Tiles</u>	<u>Number of Med. Tiles</u>	<u>Area Covered by Med. Tiles</u>	<u>Number of Large Tiles</u>	<u>Area Covered by Large Tiles</u>	<u>Is Total Area 992 in²?</u>
From Answers	Number of Sm. Tiles $\times 4 \text{ in}^2$	$\frac{1}{3} \times$ Number of Sm. Tiles	Number of Med. Tiles $\times 8 \text{ in}^2$	$(2 \times \text{Number of Med. Tiles}) - 64$	Number of Lg. Tiles $\times 12 \text{ in}^2$	Sm. $\text{in}^2 +$ Med. $\text{in}^2 +$ Lg. in^2
A. 102	$102 \times 4 \text{ in}^2 = 408 \text{ in}^2$	$\frac{1}{3} \times 102 = 34$	$34 \times 8 \text{ in}^2 = 272 \text{ in}^2$	$(2 \times 34) - 64 = 4$	$4 \times 12 \text{ in}^2 = 48 \text{ in}^2$	$408 \text{ in}^2 + 272 \text{ in}^2 + 48 \text{ in}^2 = 728 \text{ in}^2$
B. 114	$114 \times 4 \text{ in}^2 = 456 \text{ in}^2$	$\frac{1}{3} \times 114 = 38$	$38 \times 8 \text{ in}^2 = 304 \text{ in}^2$	$(2 \times 38) - 64 = 12$	$12 \times 12 \text{ in}^2 = 144 \text{ in}^2$	$456 \text{ in}^2 + 304 \text{ in}^2 + 144 \text{ in}^2 = 904 \text{ in}^2$
C. 120	$120 \times 4 \text{ in}^2 = 480 \text{ in}^2$	$\frac{1}{3} \times 120 = 40$	$40 \times 8 \text{ in}^2 = 320 \text{ in}^2$	$(2 \times 40) - 64 = 16$	$16 \times 12 \text{ in}^2 = 192 \text{ in}^2$	$480 \text{ in}^2 + 320 \text{ in}^2 + 192 \text{ in}^2 = 992 \text{ in}^2$

Answer: C. 120