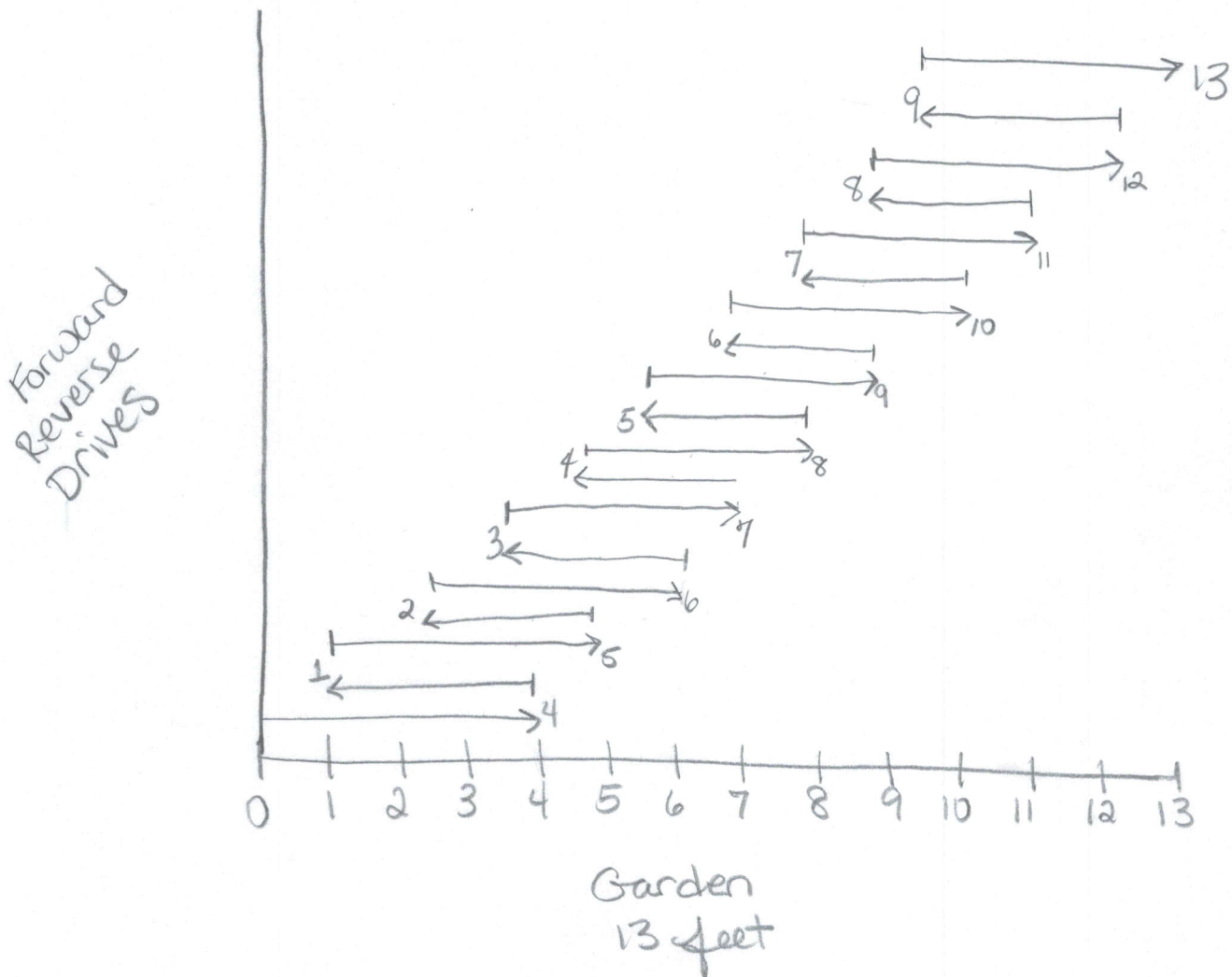Problem Solving with Creative Math
Quiz Chapter 1

Name _Key_

1. The gearshift on Maxine's rototiller was malfunctioning. She found that it would travel forward 4 feet in one minute, but then shift into reverse and go back 3 feet before the shift would allow her to put it back in forward. The backwards part also took about a minute to complete. How long would it take her to till a 13-foot-long section of her garden with this rototiller?
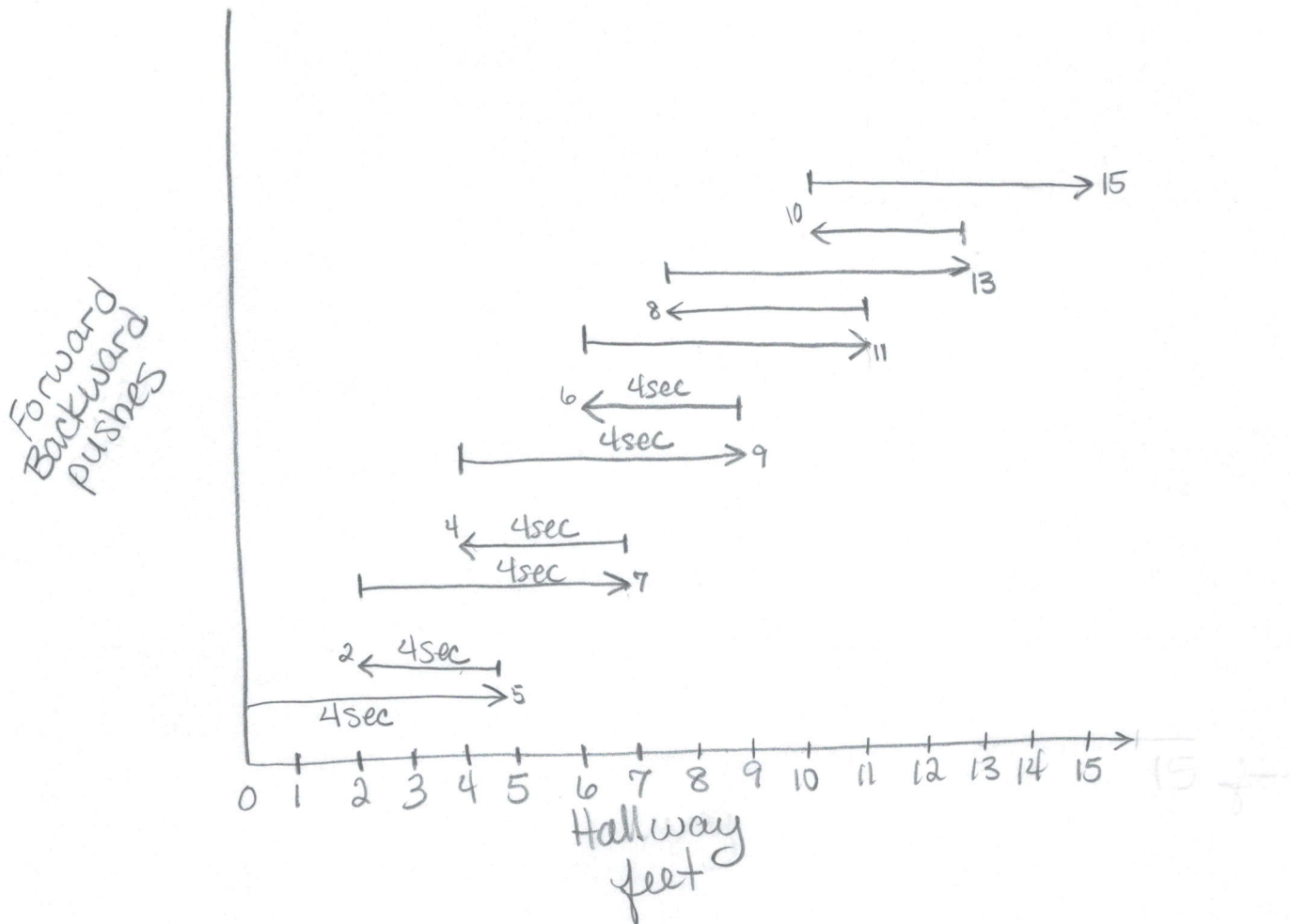

Garden
13 feet

19 minutes

maxine gains 1 foot for every 4 she tills because of the malfuncting rototiller. After reaching 9 feet, she is able to till the final 4 feet and complete the job before the machine kicks into reverse.

Name __Key__

1. Janae was vacuuming the narrow hallway in her house. She went 5 feet forwards in the first 4 seconds, then went 3 feet backwards in the next 4 seconds. She continued to do this, forwards 5 feet in 4 seconds and backwards 3 feet in 4 seconds. If she continues in this way, how many seconds will it take her to reach the end of her hallway, which is 15 feet long?

Forward
Backward
pushes

15

10

13

8

11

6 4sec

4sec 9

4 4sec

4sec 7

2 4sec

5

4sec

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Hallway
feet

11 4 second pushes, 44 seconds

Janae gains two feet each push for 5 back and forth strokes to reach 10 feet after which she pushes 5 feet in one last stroke to reach the end. It takes her 44 seconds to reach the end.

Name **Key**

The corner convenience store sells candy in 20¢, 30¢, and 50¢ packages.
How many ways can Waylon spend exactly $3.00 on candy?

10 points
5 points for detailed solution (make the list), 3 points for written summary (3-5 sentences explaining your approach), 2 points for final answer (number of ways).

21 ways

50 ¢	30 ¢	20 ¢	
6	0	0	
5	1	1	
4	2	2	
4	0	5	
3	5	0	← maximum 30¢ for 150 is 5
3	3	3	
3	1	6	
2	6	1	
2	4	4	
2	2	7	
2	0	10	
1	7	2	
1	5	5	
1	3	8	
1	1	11	
0	10	0	

Then move down by 2s for 30¢ because 60¢ is a multiple of 20.

6 × 30¢ = 1.80 plus 20¢ is 2.00 Then move down by 2s for 30¢ and up by 3s for 20¢.

16

Problem Solving
Quiz Chapter 2

Name **Key**

How many ways are there to make change for 70 cents, using quarters, dimes, and nickels? Note: No pennies!

10 points

5 points for detailed solution (make the list), 3 points for written summary (3-5 sentences explaining your approach), 2 points for final answer (number of ways).

25¢	10¢	5¢			
2	2	0			
2	1	2			
2	0	4			
1	4	1			
1	3	3			
1	2	5			
1	1	7			
0	7	0	1	0	9
0	6	2			
0	5	4			
0	4	6			
0	3	8			
0	2	10			
0	1	12	16 ways		
0	0	14	→		

I started with the maximum number of quarters possible and worked all possible combinations of 20¢ with dimes and nickels, I then went to one quarter and worked out combinations of dimes and nickels that summed to 45¢. I kept track of dimes and

Quiz 3

programs < 100
     4 : r3
     5 : r3
     7 : r6
     3 : r2

①		②	③		④
20	→	23			17
40	→	43			37
60	→	63	X		57
80	→	83			77 ⑤

$$\boxed{83}$$

① List numbers divisble by 4 and 5
② Add 3 — one of these numbers work
③ Cross off anything divisible by 7 or 3
④ Subtract 6 and list what are divisible by 7
⑤ 83 has a remainder of 6 when divided by 7
⑥ check $83 \div 3 = 27 : r2$

$$\begin{array}{r} 27 \\ 3\overline{)81} \\ \underline{6} \\ 21 \end{array}$$

Key

Elaine, Leisa, Brittney, and Consuelo each have a hobby: model railroading, building model airplanes, rocketry, or raising tropical fish. Match each woman to her hobby by using the clues below.

1. Leisa has never met the person who does rocketry.

2. Elaine is a pilot and, ironically, has a hobby that has nothing to do with aeronautics.

3. The rocketry hobbyist, the railroader, and Brittney are friends.

4. Leisa's hobby involves public transportation.

	Railroad	Airplanes	Rocketry	Fish
Elaine	O5	X2	X2	X5
Leisa	X5	O5	X1	X5
Brittney	X3	X5	X3	O5
Consuelo	X3	X3	O3	X3

1. Leisa ≠ rocketry
2. Elaine ≠ rocketry ≠ airplanes
3. rocketry ≠ Brittney
   railroad ≠ Brittney
   consuelo = rocketry

4. Leisa = airplanes or railroad

5. From (1) if rocketry + railroader are friends, then Leisa ≠ railroad

   Leisa = airplanes
   Elaine = railroad
   Brittainy = fish

Quiz 4 Key

Amaya, Ostergard, Blue Cloud, and Katricz are the last names of Timothy, Diana, Mack, and Sherry. They are all playing in a mixed doubles tennis tournament. Two people are on each team. There is one man and one woman on each team. Determine the full name of each player by using the clues below.

1. Mack is a better player than Ostergard.

2. Timothy is Diana's partner.

3. Sherry and Katricz are on the same team.

4. Amaya is known for his wicked serve.

5. Katricz is an opponent of Ostergard.

6. Blue Cloud is an opponent of Amaya.

	Mark	Tim	Sherry	Diana
Amaya	X_7	O_8	X_8	X_8
Ostergard	X_1	X_8	X_8	O_9
Blue Cloud	X_7	X_8	O_9	X_9
Katricz	O_7	X_7	X_3	X_7

1. mark ≠ ostergard
2. Tim is Diana's partner *
3. sherry ≠ katricz
4. Amaya = mark or Tim "his"
5. Katricz is an opponent of Ostergard *
6. Blue cloud is an opponent of Amaya
7. From Teams Adjunct list: Tim ≠ katricz, Diana ≠ katricz, Mark = katricz
8. From (5): sherry ≠ ostergard, From (4) Tim = Amaya
9. sherry = Blue Cloud, Diana = Ostergard

Teams

Tim + Diana
sherry + katricz
mark + Sherry

Four friends—LaTisha, Zack, Steve, and Michelle—are working in summer jobs. The jobs they have found this summer include food server, lifeguard, construction worker, and clerk at a grocery store. Determine who is working which job by using the clues below.

1. The person doing the food-serving job really likes <u>his</u> work.

2. Zack and the lifeguard have known each other for years.

3. Both Michelle and the lifeguard are outside most of the time, and the other two are inside most of the time.

4. LaTisha and the person working construction met on their job last summer.

5. Neither Zack nor the food server worked last summer.

	Server	LifeGuard	Construction	Clerk
LaTisha	X5	O7	X3,4	X7
Zack	X5	X2	X3	Ⓞ7
Steve	O6	X6	X3	X6
Michelle	X3	X3	O3	X3

1. Server likes "his" work
   server = zack or Steve
2. zack ≠ lifeguard
3. michelle "outside"   michelle = construction
   michelle ≠ lifeguard
4. LaTisha construction met on job last summer
   LaTisha ≠ construction
5. Zack ≠ server, LaTisha ≠ server
   neither worked last summer
6. Steve = Server

7. LaTisha = lifeguard
   Zack = clerk

Quiz 5
Problem Solving

Name_____Key_____

Yale Record Club made me an offer I couldn't refuse. For their low prices I could buy
millions of records, tapes, and compact discs (CDs) and save millions of dollars. Well,
anyway, I joined. The first month I bought 3 CDs, and the cost was $24.84. The second
month I ordered 5 for a total of $38.82. Did I mention that the cost covered the CDs and
the shipping and handling? Anyway, for $31.83 I bought 4 CDs the next month. I paid
$17.85 for 2 discs the next month. I looked through their catalog and picked out 38 more
CDs that I wanted to buy sometime. If I buy all 38 at once, then I pay the shipping and
handling fee only once. On the other hand, if I buy them in smaller groups, well . . . What
I really need to know is, how much would it cost to buy all 38 CDs as one order?

10 points

5 points for detailed solution (drawing and/or list), 3 points for a summary of your
approach, 2 points for final answer *please circle* (how much are 38 CDs all at once).

3 CDs $24.84

5 CDs $38.82

4 CDs $31.83

2 CDs $17.85

$$\overset{(5)}{} \quad \overset{(4)}{}$$
CDs cost $38.82 - 31.83$
$6.99 each

Shipping and Handling
costs
$2 \cdot 6.99 = $ cost of 2 CDs
w/o S+H

$13.98
So $17.85 - 13.98 = S+H

S+H = $3.87

38 CDs will cost
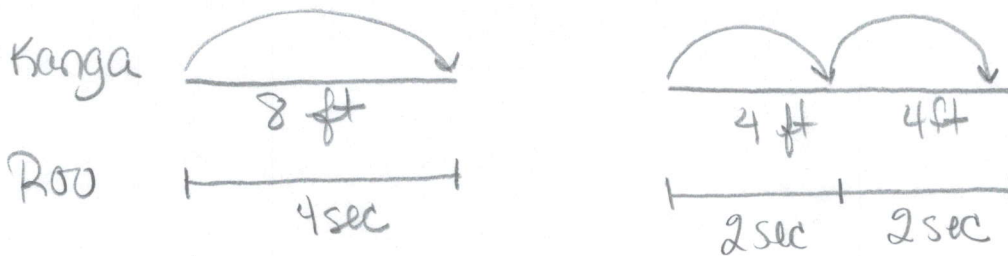
$= \$6.99 (38) + 3.87$

$= 269.49$

Quiz 5
Problem Solving

Name **Key**

Kanga and Roo decided to have a race. Kanga jumps 8 feet with every jump and makes one jump every 4 seconds. Roo, on the other hand, jumps twice as fast (one jump every 2 seconds) but jumps only 4 feet with each jump. The racecourse was 100 feet long, with the race being up and back. (So that's 200 feet total.) Who won and by how far?

10 points

5 points for detailed solution (drawing and/or list), 3 points for a summary of your approach, 2 points for final answer *please circle* (who won and by how much).

Kanga ⌒ 8 ft

Roo ⊢———⊣ 4 sec

⌒ 4 ft   ⌒ 4 ft

⊢———⊣———⊣ 2 sec   2 sec

Kanga ⊢————————————————————⊣
12 jumps
96 ft
12   100   104
4 ft   4 ft

Roo ⊢————————————————————⊣
100
25 jumps
100 ft

Roo wins by 8 feet