Name: Answer Key

Group: _____ Date: _____

EXTRA PRACTICE

## *Objective 7.2* To represent a system of linear relations by a table of values.

## Chapter 3

**1.** Michael gets an estimation on the cost to repair his computer. AC Info Inc. charges a flat rate of $60 plus $50 per hour. ORDI Electronics charges a flat rate of $50 plus $54 per hour. Consider the relation between the number of hours needed to repair the computer and the total repair costs.

***a)*** Translate the situation into a system of linear relations.

AC $y_1 = 50x + 60$ ORDI $y = 54x + 50$

***b)*** Make a table of values.

| $x$ | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| $y_1$ | 60 | 110 | 160 | 210 | | | |
| $y_2$ | 50 | 104 | 158 | 212 | | | |

***c)*** Solve the system using the table. The cost is almost the same after 2 hours

***d)*** Which company should Michael choose if he anticipates the repairs will take more than 3 h?

AC would be cheaper after 2 hours

**2.** This summer both Melanie and Dominic had jobs. They saved $1500 and $1800, respectively. They will use these sums as spending money during the course of the school year. Melanie expects to spend $40 per week and Dominic $50 per week. Consider the relation between the time (in weeks) and the balance of their savings.

***a)*** Translate the situation into a system of linear relations.

Melanie $y = -40x + 1500$ Dominic $y = -50x + 1800$

***b)*** Make a table of values for the situation.

| $x$ | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $y_1$ | 1500 | 1460 | 1420 | 1380 | 1340 | 1300 | 1260 | 1220 | 1180 | 1140 | 1100 | 1060 | 1020 | 980 | 940 |
| $y_2$ | 1800 | 1750 | 1700 | 1650 | 1600 | 1550 | 1500 | 1450 | 1400 | 1350 | 1300 | 1250 | 1200 | 1150 | 1100 |

***c)*** How many weeks will it take for their savings to be equal?

30 weeks

| $x$ | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $y_1$ | 900 | 860 | 820 | 780 | 740 | 700 | 660 | 620 | 580 | 540 | 500 | 460 | 420 | 380 | 340 | 300 |
| $y_2$ | 1050 | 1000 | 950 | 900 | 850 | 800 | 750 | 700 | 650 | 600 | 550 | 500 | 450 | 400 | 350 | 300 |

3. In January, Paul weighed 90 kg. He went on a diet for one year and lost an average of 1.5 kg per month. During the same period, his son, who weighed 72 g, gained weight at an average of one kg per month. Consider the relation between the time (in months) and each person's weight.

*a)* Give a system of linear relations for this situation.

Paul $y_1 = -1.5x + 90$ Paul's Son $y_2 = 1x + 72$

*b)* Make a table of values.

| $x$ | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $y_1$ | 90 | $88.5$ | 87 | $85.5$ | 84 | $82.5$ | 81 | $79.5$ | 78 | $76.5$ | 75 | $73.5$ |
| $y_2$ | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 |

*c)* When will Paul reach his desired weight of 75 kg? After the 6th month In the 7th month

*d)* Solve and interpret the system.

Paul and his son will be the same weight in approximately 7 months

4. To rent a jet ski, Marilyn must pay an initial fee of $20 plus $25 per hour. Her friend Luke pays an initial fee of $10 plus $30 per hour for his rental. Consider the relation between rental time and the rate.

*a)* Translate the situation into a system of linear relations.

$y_1 = 25x + 20$ $y_2 = 30x + 10$

*b)* Make a table of values.

*c)* After how many hours will Marilyn and Luke have paid the same amount?

2 hours

| $x$ | 0 | 1 | 2 | | | |
|---|---|---|---|---|---|---|
| $y_1$ | 20 | 45 | 70 | | | |
| $y_2$ | 10 | 40 | 70 | | | |

5. Sean earns $6.70/h plus $100 in tips (on average) per week. Julie earns $9.25/h but does not get tips. Consider the relation between the number of hours worked and Sean and Julie's weekly salaries.

*a)* Translate the situation into a system of linear relations.

Sean $y_1 = 6.7x + 100$ Julie $y_2 = 9.25x$

*b)* Make a table of values for earnings from 32 to 40 weeks of work.

*c)* Which person's salary is higher for a 40-hour workweek?

Julie

| | $x$ | 32 | 34 | 36 | 38 | 40 |
|---|---|---|---|---|---|---|
| Sean | $y_1$ | 314.4 | 327.80 | 341.20 | 354.60 | 368 |
| Julie | $y_2$ | 296 | 314.50 | 333 | 351.50 | 370 |