

**Final Exam Review**

1. Write a 5-digit number that is divisible by 8.

The last 3 digits must be divisible by 8, then choose any digits for the rest.

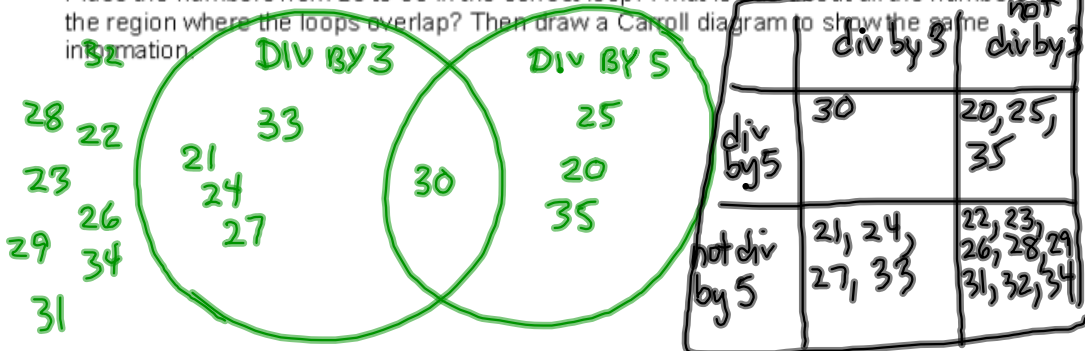
examples  $\begin{array}{r} 19008 \\ 25008 \end{array}$   $\begin{array}{r} 96008 \\ 49800 \end{array}$   $\begin{array}{r} 13016 \\ 99024 \end{array}$

2. A number is missing the tens digit. The number is 51 3□6. What could the tens digit be if the number is divisible by 2? By 4? By 8?

51 3 □ 6  
 divisible by 2 → even → number is even → all digits work  
 divisible by 4 → last 2 must be divisible by 4.  
 divisible by 8 → last 3 must be div by 8 → 16, 36, 56, 76, 96 → 336, 376

3. Draw a Venn diagram with 2 loops. Label the loops "Divisible by 3" and "Divisible by 5."

Place the numbers from 20 to 35 in the correct loop. What is true about all the numbers in the region where the loops overlap? Then draw a Carroll diagram to show the same information.



4. Which numbers are divisible by 4? By 8? By 10?

How do you know?

4	a) 80 ✓	b) 216 ✓	c) 182 ✓	d) 350 ✗	e) 2160 ✓	f) 2092 ✓
8	✓	✓	✗	✗	✓	✗
10	✓	✗	✗	✓	✓	✗

BY 4 → LAST 2 DIGITS MUST BE  
 BY 8 → LAST 3 DIGITS MUST BE (MUST ALSO BE DIV BY 4)  
 BY 10 → ENDS IN ZERO

4. Explain why a number with 0 in the ones place is divisible by 5.

All digits divisible by 5 end in zero or 5.

5. Suppose you have 60 granola bars. You must share the bars equally with everyone on the school bus. How many granola bars will each person get, in each case?

a) There are 15 people on the bus

$$\frac{60}{15} = 4 \text{ each or } 15, 30, 45, (60)$$

b) There are 12 people on the bus.

$$\frac{60}{12} = 5 \text{ each or } 12, 24, 36, 48, (60)$$

c) There is no one on the bus.

not possible

7. Write an algebraic expression for each statement.

a) Nine more than a number

$$n + 9 \text{ or } 9 + n$$

b) Eighteen times a number

$$18 \times b \text{ or } 18b$$

c) A number divided by seven

$$n \div 7 \text{ or } \frac{n}{7}$$

d) Twelve less than a number

$$a - 12$$

e) Six more than eleven times a number

$$b + 11x \text{ or } 11x + 6$$

f) Eight times a number is subtracted from 23

$$23 - 8c$$

any letter can be used for the variable

8. Which algebraic expression can be used to describe each phrase? Circle the correct answer.

a) A number divided by 2

$$a + \frac{1}{2} \quad \frac{1}{2} - a \quad \left( \frac{a}{2} \right)$$

c) Five less than four times a number

$$5 - 4n \quad \left( 4n - 5 \right) \quad 4(n - 5)$$

e) Twelve added to twice a number

$$\left( 2n + 12 \right) \quad 2(n + 12) \quad 12 - 2n$$

9. Let  $n$  represent any term number. Write a relation for the term for each number pattern.

Term Number	1	2	3	4	5
Term	7	14	21	28	35

each increases by 7

$7n$  ← best answer

or  $7 \times n$   
or  $n \times 7$

10. The cost of soccer jerseys for the soccer team is \$50 for the initial set-up, plus \$15 for each jersey ordered.

- a) Write a relation for the total cost of  $j$  jerseys.

$$50 + 15j \quad \text{or} \quad 15j + 50$$

- b) Another company charges \$80 for the initial set-up, and \$12 per jersey. Write a relation for the total cost of  $j$  jerseys for this company.

$$80 + 12j \quad \text{or} \quad 12j + 80$$

- c) Which company would charge less if you ordered 12 jerseys?

$$\begin{aligned} 50 + 15j \\ 50 + 15(12) \\ 50 + 180 = \$230 \end{aligned}$$

$$\begin{aligned} * 80 + 12j &\longrightarrow \text{COSTS LESS FOR 12 Jerseys} \\ 80 + 12(12) & \\ 80 + 144 = \$224 & \end{aligned}$$

11. There are  $b$  students in the concert band. Write a relation for each statement.

- a) the total number of music stands, if each pair of students shares one stand

$$\frac{b}{2} \quad \text{or} \quad b \div 2$$

- b) the total number of chairs, if there are 4 more chairs than students

$$b + 4$$

12. Use algebra. Write a relation for each Input/Output table.

a)

Input $n$	Output
1	$1 \times 9 \rightarrow 9$
2	$2 \times 9 \rightarrow 18$
3	$3 \times 9 \rightarrow 27$
4	$4 \times 9 \rightarrow 36$
5	$5 \times 9 \rightarrow 45$

$$n \rightarrow 9n$$

or  $9 \times n$   
or  $n \times 9$

b)

Input $n$	Output
1	$1 \times 5 + 6 \rightarrow 11$
2	$2 \times 5 + 6 \rightarrow 16$
3	$3 \times 5 + 6 \rightarrow 21$
4	$4 \times 5 + 6 \rightarrow 26$
5	$5 \times 5 + 6 \rightarrow 31$

$$n \rightarrow 5n + 6$$

or  $n \times 5 + 6$

increases by 5

13. Admission to the Carnival is \$4. Each game played costs an additional \$2.

a) Write a relation to show how the total cost is related to the number of games played.

# of games =  $g$

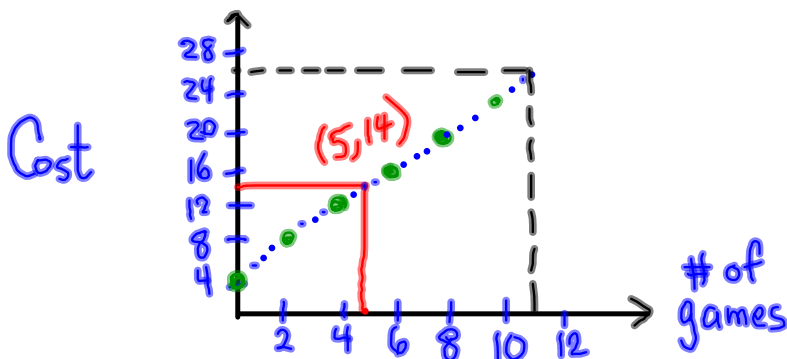
$$4 + 2g$$

b) Create a table of values to show the total cost if you play 0, 2, 4, 6, 8, or 10 games.

$g$	0	2	4	6	8	10
C-cost	4	8	12	16	20	24

$4 + 2(0)$   
 $4 + 0 = 4$   
 $4 + 2(2)$   
 $4 + 4 = 8$

c) Graph the relation. Describe the graph.



$$4 + 2(4)$$

$$4 + 8 = 12$$

⋮

\* DO NOT  
join the points.  
This is DISCRETE  
data.

d) Use the graph to find how much would it cost to play 5 games and how many games could you play for \$26?

5 games costs \$14

\$26 is the cost of 11 games

14. Write an equation for each sentence.

a) Two more than five times a number is 17.

$$2 + 5n = 17$$

b) Shawn's age 9 years from now will be 23.

$$a + 9 = 23$$

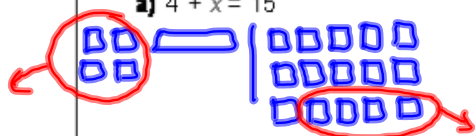
c) The cost of three bags of popcorn at \$3 each, and two drinks at  $d$  dollars each is \$13.

$$3(3) + 2d = 13$$

$$\text{or } 3 \times 3 + 2d = 13$$

15. Solve each equation.

a)  $4 + x = 15$

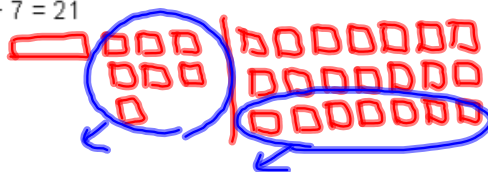


$$4 + x = 15$$

$$4 - 4 + x = 15 - 4$$

$$x = 11$$

b)  $a + 7 = 21$

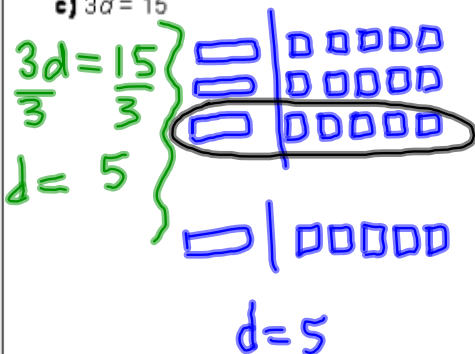


$$a + 7 = 21$$

$$a + 7 - 7 = 21 - 7$$

$$a = 14$$

c)  $3d = 15$

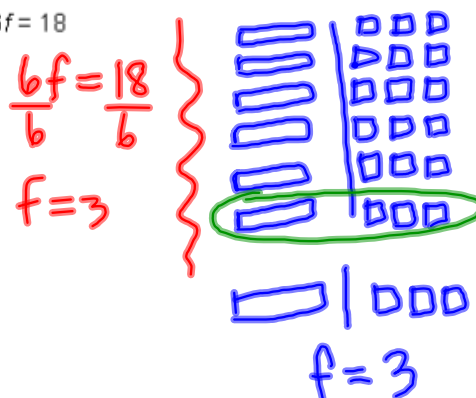


$$3d = 15$$

$$\frac{3d}{3} = \frac{15}{3}$$

$$d = 5$$

d)  $6f = 18$



$$6f = 18$$

$$\frac{6f}{6} = \frac{18}{6}$$

$$f = 3$$