

# Chapter 1 Review

# Solutions

Foundations of Math 11 Chapter 1 Review

Name: SOLUTIONS.

- d 1. Gary works at a bicycle store in Vancouver. For the start of spring, the manager of the store has ordered 50 mountain bikes and 10 racing bikes.

Which conjecture is Gary most likely to make from this evidence?

- a. Either type of bike will sell equally well.
- b. Racing bikes will likely sell better than mountain bikes.
- c. It will rain all summer and no one will ride bicycles.
- d. Mountain bikes will likely sell better than racing bikes.

- a 2. Which conjecture, if any, could you make about the sum of two odd integers and one even integer?

- a. The sum will be an even integer.
- b. The sum will be an odd integer.
- c. The sum will be negative.
- d. It is not possible to make a conjecture.

Evidence x3

$$3 + 5 + 2 = 10$$

$$-1 + -7 + -6 = -14$$

$$9 + -11 + 4 = 2$$

- a 3. Which conjecture, if any, could you make about the product of an odd integer and an even integer?

- a. The product will be an even integer.
- b. The product will be an odd integer.
- c. The product will be negative.
- d. It is not possible to make a conjecture.

Evidence x3

$$3 \times 4 = 12$$

$$-5 \times -6 = 30$$

$$7 \times -10 = -70$$

- d 4. Julia created the following table to show a pattern.

<b>Multiples of 9</b>	18	27	36	45	54
<b>Sum of the Digits</b>	9	9	9	9	9

Which conjecture could Julia make, based solely on this evidence?  
Choose the best answer.

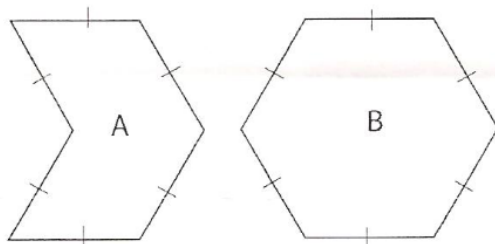
- a. The sum of the digits of a multiple of 9 is divisible by 9.
- b. The sum of the digits of a multiple of 9 is an odd integer.
- c. The sum of the digits of a multiple of 9 is equal to 9.
- d. Julia could make any of the above conjectures, based on this evidence.

# Solutions

- d 5. Sasha made the following conjecture:

All polygons with six equal sides are regular hexagons.

Which figure, if either, is a counterexample to this conjecture? Explain.



- Figure A is a counterexample, because all six sides are equal and it is a regular hexagon.
- Figure B is a counterexample, because all six sides are equal and it is a regular hexagon.
- Figure B is a counterexample, because all six sides are equal and it is not a regular hexagon.
- Figure A is a counterexample, because all six sides are equal and it is not a regular hexagon.

- b 6. Pearl made the following conjecture.

The sum of a multiple of 4 and a multiple of 8 must be a multiple of 8.

Is the following equation a counterexample to this conjecture? Explain.

$$24 + 24 = 48$$

- No, it is not a counterexample, because 48 is not a multiple of 8.
- No, it is not a counterexample, because 48 is a multiple of 8.
- Yes, it is a counterexample, because 48 is not a multiple of 8.
- Yes, it is a counterexample, because 48 is a multiple of 8

- b 7. Debbie gathered the following evidence.

$$4(33) = 132$$

$$5(33) = 165$$

$$6(33) = 198$$

Which conjecture, if any, is Debbie most likely to make from this evidence?

- When you multiply a two-digit number by 33, the first and last digits of the product form a number that is twice the original number.
- When you multiply a one-digit number by 33, the first and last digits of the product form a number that is three times the original number.
- When you multiply a one-digit number by 33, the sum of the digits in the product is equal to the original number.
- None of the above conjectures can be made from this evidence.

# Solutions

- d 8. Justin gathered the following evidence.

$17(22) = 374$

$14(22) = 308$

$36(22) = 742$

$18(22) = 396$

Which conjecture, if any, is Justin most likely to make from this evidence?

- When you multiply a two-digit number by 22, the last and first digits of the product are the digits of the original number.
- When you multiply a two-digit number by 22, the first and last digits of the product are the digits of the original number.
- When you multiply a two-digit number by 22, the first and last digits of the product form a number that is twice the original number.
- None of the above conjectures can be made from this evidence.

- a 9. All cats are mammals. All mammals are warm-blooded. Tasha is a cat.  
What can be deduced about Tasha?

- Tasha is warm-blooded.
- Tasha is a mammal.

- Choice 1 and Choice 2
- Neither Choice 1 nor Choice 2
- Choice 1 only
- Choice 2 only

- d 10. All alligators are reptiles. All reptiles are covered with scales.  
Natalie is a cat. What can be deduced about Natalie?

- Natalie has scales.
- Natalie is a reptile.

- Choice 1 and Choice 2
- Choice 1 only
- Choice 2 only
- Neither Choice 1 nor Choice 2

- C 11. Which of the following choices, if any, uses inductive reasoning to show that the sum of two odd integers is even?

- $(2x + 1) + (2y + 1) = 2(x + y + 1)$
- $2x + 2y + 1 = 2(x + y) + 1$
- $3 + 5 = 8$  and  $7 + 5 = 12$
- None of the above choices

- C 12. Determine the unknown term in this pattern.

8, 17, 14, 23, \_\_\_\_\_, 29, 26, 35

- 21
- 22
- 20
- 25

# Solutions

- d 13. Choose the next figure in this sequence.



Figure 1

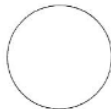


Figure 2

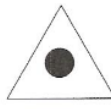


Figure 3



Figure 4



Figure 5

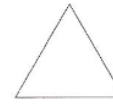

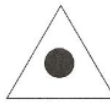




Figure 6

- a. 
- b. 
- c. 
- d. 

- d 14. What type of error, if any, occurs in the following deduction?

All students who graduate from Urban City High School with an average of 95% or more will get their photograph in the local newspaper. Jerome graduated from Urban City High School with a 96% average. Therefore, Jerome will get his photograph in the local newspaper.

- a. a false assumption or generalization  
 b. an error in reasoning  
 c. an error in calculation  
 d. There is no error in the deduction.

- c 15. What type of error, if any, occurs in the following proof?

$$\begin{aligned} 2 &= 2 \\ 4(2) &= 4(1 + 1) \\ 4(2) + 3 &= 4(1 + 1) + 3 \\ 8 + 3 &= 6 + 3 \\ 11 &= 9 \end{aligned}$$

- a. a false assumption or generalization  
 b. an error in reasoning  
 c. an error in calculation  
 d. There is no error in the proof.



# Solutions

b 16. What type of error, if any, occurs in the following proof?

SIX = 6	I know that "six" and "6" are different ways of writing the same thing.
IX = 9	In roman numerals, IX represents the number 9.
SIX has more letters than IX.	Therefore, SIX must be greater than IX.
6 > 9	

b 17. Which number should go in the grey square in this Sudoku puzzle?

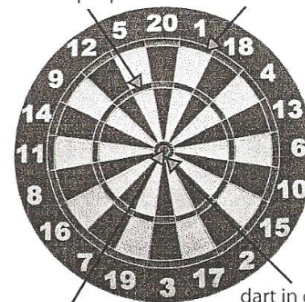
1		5		3		2	6	
7		3			8		4	
			9					
	1							2
		7	5		6	8		
4							9	
					3			
	4		2			7		1
	6	2		5		4		9

- a. 5
- b. 7
- c. 1
- d. 3

d 18. Emma and Alexander are playing darts. Emma has a score of 37. To win, she must reduce her score to zero and have her last counting dart be a double. Which of the following scores on the dart board, in order, would give her the win?

- a. 15, 16, 6
- b. 8, 7, double 10
- c. double 11, 6, 9
- d. 9, 6, double 11

dart in this ring scores triple points      dart in this ring scores double points



dart in inner bull scores 50 points (the inner bull also counts as a double)

dart in outer bull scores 25 points

# Solutions

20. Star claims that whenever you add an odd integer to the square of an odd integer, the result is an odd number. Is her conjecture reasonable? Briefly justify your decision.

Stars conjecture is not reasonable  
 Since  $3 + 3^2 = 3 + 9$  or 12 and 12  
 is even, not odd.

21. Ally made the following conjecture:

All people who can skate well are professional hockey players.

Do you agree or disagree? Briefly justify your decision with a counterexample if possible.

I disagree with Ally's conjecture  
 since a counterexample can be found.  
 \* Figure skaters can skate very well,  
 but they are not professional hockey  
 players.

22. Prove the following number trick using deductive reasoning.

Think of a number	$n$
Double it	$2n$
Add 10	$2n + 10$
Take away 6	$2n + 4$
Take half of your answer	$n + 2$
Take away 2	$n$
The answer is the original number	✓

# Solutions

23. Circle the error in the following proof and make any necessary corrections.

<u>Instructions</u>	<u>Proof</u>	<u>Corrections</u>
Think of a Number	$n$	✓
Add 3	$4n$	$n+3$
Double your answer	$8n$	$2n+6$
Add 4	<del><math>8n+4</math></del>	<del><math>2n+10</math></del>
Divide the result by 2	$4n+2$	$n+5$
Take away the original number	$3n+2$	5
The answer is always 5!	$5n$	✓