Foundations of Math 11 - Chapter 1 and Chapter 2 Exam Review

Multiple Choice
Identify the choice that best completes the statement or answers the question.

C　1. Emma works part-time at a bakery shop in Saskatoon. Today, the baker made 20 apple pies, 20 cherry pies, and 20 bumbleberry pies.
Which conjecture is Emma most likely to make from this evidence?

A) People are more likely to buy bumbleberry pie than any other pie.
B) People are more likely to buy apple pie than any other pie.
C) Each type of pie will sell equally as well as the others.
D) People are more likely to buy cherry pie than any other pie.

D　2. Justin gathered the following evidence.

$$17(22) = 374 \qquad 14(22) = 308 \qquad 36(22) = 742 \qquad 18(22) = 396$$

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

A) When you multiply a two-digit number by 22, the last and first digits of the product are the digits of the original number.
B) When you multiply a two-digit number by 22, the first and last digits of the product are the digits of the original number.
C) 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.
D) None of the above conjectures can be made from this evidence.

B

3. Which conjecture, if any, could you make about the product of two odd integers?

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

$3 \times 5 = 15$
$-7 \times 11 = -77$ } All Odd
$-9 \times -13 = 177$

D

4. Randolph made the following conjecture.

The sum of a multiple of 4 and a multiple of 8 must be a multiple of 2.

Which choice, if either, is a counterexample to this conjecture?

1. $4 + 8 = 12$
2. $8 + 8 = 16$

A) Choice 2 only
B) Choice 1 and Choice 2
C) Choice 1 only
D) Neither Choice 1 nor Choice 2

D   5. Athena 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.

   $12 + 24 = 36$ ← not a multiple of 8.

   A) Yes, it is a counterexample, because 36 is a multiple of 8
   B) No, it is not a counterexample, because 36 is a multiple of 8.
   C) No, it is not a counterexample, because 36 is not a multiple of 8.
   (D) Yes, it is a counterexample, because 36 is not a multiple of 8.

B   6. Which of the following choices, if any, uses inductive reasoning to show
         that the sum of three even integers is even?

   A) $2x + 2y + 2z = 2(x + y + z)$
   (B) $2 + 4 + 6 = 12$ and $4 + 6 + 8 = 18$
   C) $x + y + z = 2(x + y + z)$
   D) None of the above choices

B 7. Which of the following choices, if any, uses deductive reasoning to show that the sum of three even integers is even?

A) $x + y + z = 2(x + y + z)$
B) $2x + 2y + 2z = 2(x + y + z)$
C) $2 + 4 + 6 = 12$ and $4 + 6 + 8 = 18$
D) None of the above choices

A 8. What type of error, if any, occurs in the following deduction?

All people drive cars to work.
Gavin drives to work.
Therefore, Gavin drives a car.

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 9. Alison created a number trick in which she always ended with the original number. When Alison tried to prove her trick, however, it did not work. What type of error occurs in the proof?

n	Use n to represent any number. ✔
$n + 4$	Add 4. ✔
$2n + 4$	Multiply by 2. (Should be $2n+8$)
$2n + 8$	Add 4.
$n + 4$	Divide by 2.
$n - 1$	Subtract 5.

C   10. Determine the unknown term in this pattern.
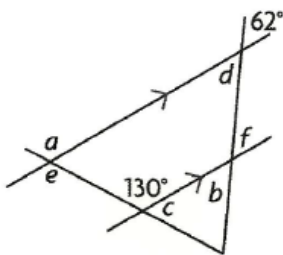
8, 17, 14, 23, ____, 29, 26, 35
  +9 -3 +9 -3 +9 -3 +9

A) 21
B) 22
C) 20
D) 25

A   11. Which number should appear in the center of Figure 4?

3 / 3+3+3 = 9
9
3   3
Figure 1

2 / 2+3+7 = 12
12
7   3
Figure 2
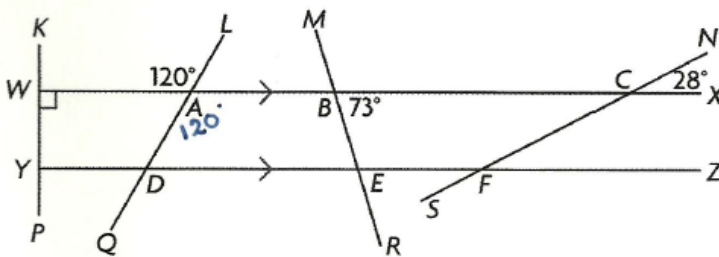
2 / 2+3+4 = 9
9
4   3
Figure 3

4 / 4+5+6 = 15
5   6
Figure 4
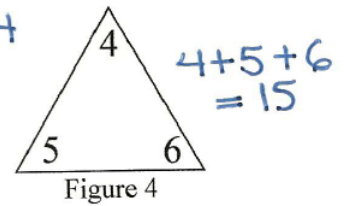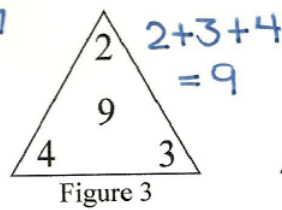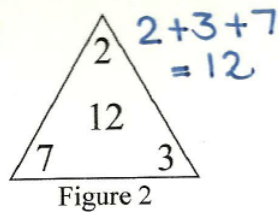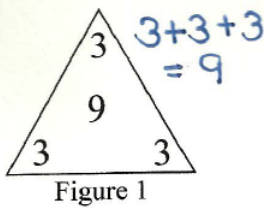
A) 15
B) 240
C) 120
D) 6

B   12. Which statement about the angles in this diagram is false?

A) $\angle a = \angle e$ ✓
B) $\angle c = \angle e$ ✗
C) $\angle d = \angle b$ ✓
D) $\angle b = \angle f$ ✓

A   13. Which angle property proves $\angle DAB = 120°$?

A) vertically opposite angles
B) alternate exterior angles
C) alternate interior angles
D) corresponding angles
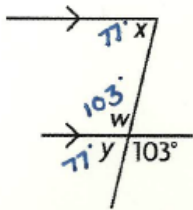
_A_ 14. Which angle property proves ∠*BEF* = 107°?
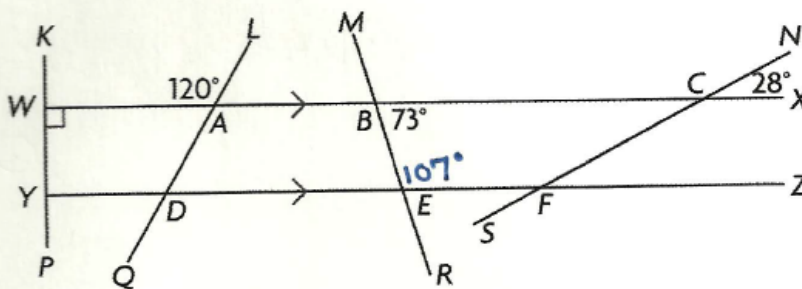
(A) supplementary angles *(interior angles).*
B) corresponding angles
C) alternate interior angles
D) alternate exterior angles
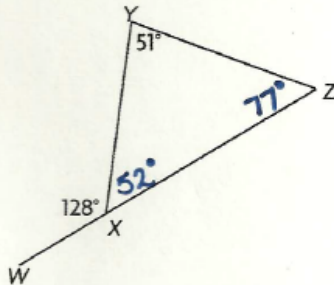
_C_ 15. In which diagrams are two lines parallel?

1.

2.

3.
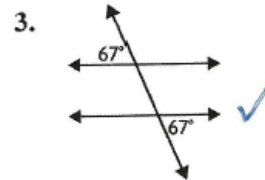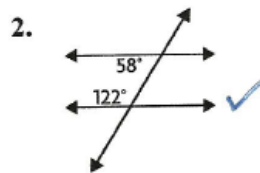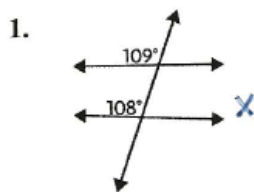
A) Choices 1, 2, and 3
B) Choice 1 and Choice 3
(C) Choice 2 and Choice 3
D) Choice 1 only

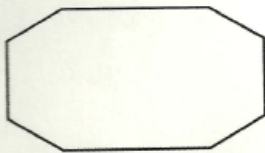_C_ 16. Which are the correct measures of the indicated angles?

77° x

103°
w

77° y / 103°

A) $\angle w = 77°$, $\angle x = 77°$, $\angle y = 103°$
B) $\angle w = 77°$, $\angle x = 103°$, $\angle y = 103°$
Ⓒ $\angle w = 103°$, $\angle x = 77°$, $\angle y = 77°$
D) $\angle w = 103°$, $\angle x = 103°$, $\angle y = 77°$

_A_ 17. Which are the correct measures for $\angle YXZ$ and $\angle XZY$?

Y
51°

77° Z

52°
128°
X

W

Ⓐ $\angle YXZ = 52°$, $\angle XZY = 77°$
B) $\angle YXZ = 52°$, $\angle XZY = 87°$
C) $\angle YXZ = 62°$, $\angle XZY = 77°$
D) $\angle YXZ = 62°$, $\angle XZY = 87°$

A 18. Determine the sum of the measures of the interior angles of this polygon.

$$S = 180(n-2)$$
$$= 180(8-2)$$
$$= 180(6)$$
$$= 1080$$

- Ⓐ 1080°
- B) 1440°
- C) 720°
- D) 540°

A 19. Each interior angle of a regular convex polygon measures 144°.
How many sides does the polygon have?

- Ⓐ 10
- B) 11
- C) 8
- D) 9

Each interior angle = $\dfrac{180(n-2)}{n}$
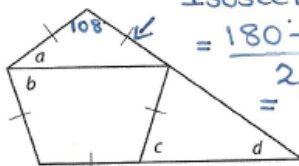
$$\dfrac{144°}{1} = \dfrac{180(n-2)}{n}$$

$$144n = 180n - 360$$
$$360 = 180n - 144n$$
$$\dfrac{360}{36} = \dfrac{36n}{36}$$
$$10 = n$$

C 20. Determine the value of a.

Isosceles $\triangle$:
$$= \dfrac{180 - 108°}{2}$$
$$= \dfrac{72}{2} = 36°$$

- A) 34°
- B) 30°
- Ⓒ 36°
- D) 32°

Each interior angle = $\dfrac{180(n-2)}{n}$
$$= \dfrac{180(5-2)}{5}$$
$$= \dfrac{180(3)}{5}$$
$$= \dfrac{540}{5}$$
$$= 108°$$

Short Answer

21. 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.

* Look for a counterexample...

$$5 + (7)^2$$
$$= 5 + 49$$
$$= 54 \leftarrow \text{not an odd number.}$$

} For Example...

Star's conjecture is not reasonable since a counterexample can be found.

22. Rachelle made the following conjecture:

Every odd number can be written as the sum of three consecutive integers.

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

* Look for a counterexample...

It is not possible to write "11" ← For example...
as the sum of three consecutive integers.

23. What number should appear in the center of Figure 4?

3	4
	144	
4	3
Figure 1

5	6
	240	
4	2
Figure 2

3	5
	360	
6	4
Figure 3

1	2
5	3
Figure 4

$3 \times 3 \times 4 \times 4$ $2 \times 4 \times 5 \times 6$ $3 \times 4 \times 5 \times 6$ $1 \times 2 \times 3 \times 5$
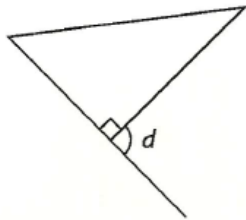$= 144$ $= 240$ $= 360$ $\boxed{= 30}$

24. Determine the value of x.

$$3x + x + 31° + 2x + 23° = 180°$$
$$6x + 54° = 180°$$
$$6x = 180° - 54°$$
$$6x = 126°$$
$$\frac{6x}{6} = \frac{126°}{6}$$
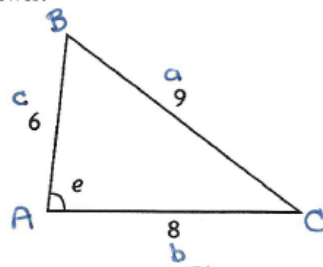$$\boxed{x = 21°}$$

(triangle with angles: $2x + 23°$, $x + 31°$, $3x$)

Problem

25. Are *d* and *e* equal? Prove your answer.

$d = 180° - 90°$

$d = 90°$

Law of Cosines:

$$\cos A = \frac{b^2 + c^2 - a^2}{2bc}$$

$$\cos A = \frac{(8)^2 + (6)^2 - (9)^2}{2(8)(6)}$$

$$\cos A = \frac{64 + 36 - 81}{96}$$

$$\cos A = \frac{19}{96}$$

$$\cos A = 0.1979$$

$$A = \cos^{-1}(0.1979)$$

$$A = 79° \Rightarrow e = 79°$$

* *d* and *e* are <u>not</u> equal.

26. Alexandra discovered a number trick in a book she was reading:

   Choose a number.
   Add 2.
   Multiply by 4.
   Add 4.
   Divide by 4.
   Subtract 3.

   Prove deductively that any number you choose will be the final result.

Choose a number	n
Add 2	$n+2$
Multiply by 4	$4n+8$
Add 4	$4n+12$
Divide by 4	$n+3$
Subtract 3	n