Name Answers Date

2.2 – Inductive Reasoning

Use inductive reasoning to make a conjecture.

2) A mathematician lands at the airport of the kingdom of Moravia. He desperately needs to use the bathroom, but he is very shy, and the social customs of the kingdom do not permit him to use the wrong bathroom. He locates the doors to what appear to be two bathrooms. He observes men entering the door marked "Warvan" and women entering the door marked "Cupore." He is finally ready to make his conjecture. What is it? How might the mathematician test his conjecture?

Warvan mean "men". Cupore means "women".
He can enter the bathroom marked "Warvan".

3) Senior Suzie Sessions is selling Simply Sumptuous Sweets to raise funds for the senior party. During first period she tells a joke about how great SSS candy is as a stress reducer during tests. She gets a laugh and sells six candy bars. During second period she uses a "hard sell" approach. Her approach is informative, but she doesn't sell any candy. During the third, fourth, and sixth periods she tries the joke approach, and each time she sells a large number of candy bars. During the fifth and seventh periods she tries her "hard sell" approach and is unsuccessful each time. Suzie conjectures...

the best approach is the joke approach.

4) Julio, sitting in the last row of a bus, notices that six students in a row get on the bus, all wearing high-top shoes, and that each student sits down on the left side of the bus. He conjectures that every student wearing high-top shoes who gets on the bus will sit on the left side of the bus. What is wrong with this conjecture? What counterexample will disprove it?

Various answers. Not everyone with high tops will sit on the left side. A student with high tops sitting on the right side will disprove it.

1) On his way to the local Hunting and Gathering Convention, Caveperson Stony Grok picks up a rock, drops it into a lake, and watches it sink. He picks up a second rock, drops it into the lake, and it also sinks. He does this five more times, and each time the rock heads straight to the bottom of the lake. Stony

conjectures: "Ura nok seblu," which translates to rocks sink in water.

What counterexample does Stony Grok need to find to disprove, or at least to refine, his conjecture?

A rock that floats in water like pumice.

Use inductive reasoning to find the next two terms in each sequence

5) 4, 8, 12, 16, 20, 24

6) 400, 200, 100, 50, 25, 12.5, 6.25

7) $\frac{1}{8}, \frac{2}{7}, \frac{1}{2}, \frac{4}{5}, \frac{5}{4}, \frac{6}{3}$ or 2

8) -5, 3, -2, 1, -1, 0, -1, -1

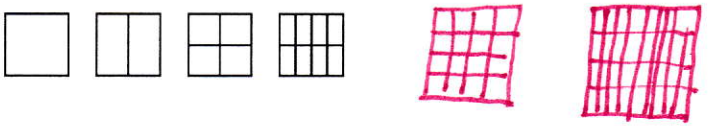
9) 360, 180, 120, 90, 72, 60

10) 1, 3, 9, 27, 81, 243, 729

11) 1, 5, 17, 53, 161, 485, 1457

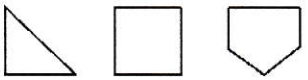
12) 1, 5, 14, 30, 55, 91, 140

Use inductive reasoning to draw the next two shapes in each picture pattern.

13) 

14) 

Use the sequence and inductive reasoning to make a conjecture.

Sequence A: 

15) How many sides does the fifth figure of Sequence A have? 7

16) How many sides does the tenth figure of Sequence A have? 12

17) How many sides does the fourteenth figure of Sequence A have? 16

Sequence B: –5, 4, –2, –5, 4, –2, –5, 4, –2, …

18) What is the tenth term of Sequence B? -5

19) What is the fifteenth term of Sequence B? -2

Make a conjecture for each scenario. Show your work.

20) the square of an odd number

$1^2=1$ $5^2=25$

$3^2=9$ $7^2=49$

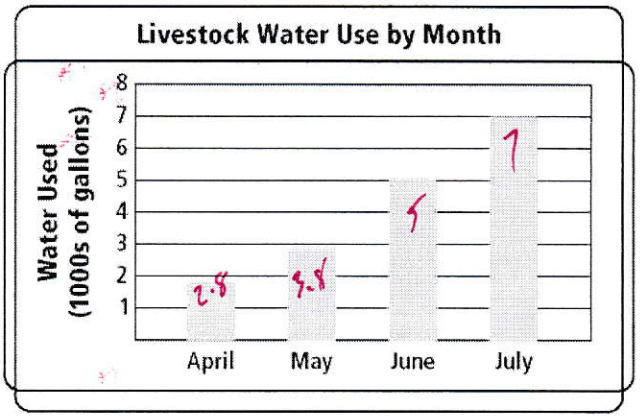
the square of an odd number is odd.

21) the product of two even numbers and an odd number . .

2·4·5
4·6·7 ...will be an even number

Use inductive reasoning to make a prediction for each scenario.

22) A farmer keeps track of the water his livestock uses each month.



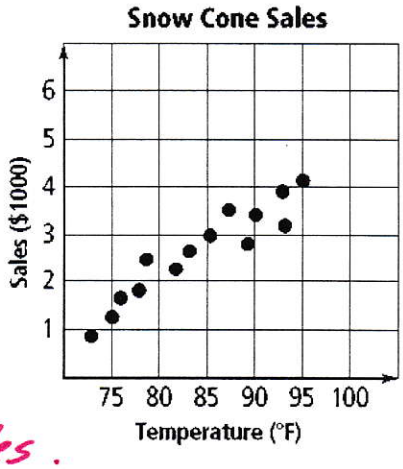
a. Predict the amount of water used in August.

between 8000 and 9000 gallons

b. Is it reasonable to use the graph to predict water consumption for October? Explain.

No. Water consumption should decrease in cooler months

23) Hannah sells snow cones during soccer tournaments. She records data for snow cone sales and temperature.



a. Predict the amount of snow cone sales when the temperature is 100°F.

about $5000

b. Is it reasonable to use the graph to predict sales for when the temperature is 15°F? Explain.

Various answers.
No, the graph would predict negative sales.

Find one counterexample to show that each conjecture is false.

24) The sum of two integers is always positive.

$-4+3=-1$

25) The product of two mixed numbers is never a whole number.

$1\frac{1}{4} \times 2\frac{2}{5} = 3$

26) All four-sided figures are rectangles.