

GRADE 8 SAMPLE ITEMS

1. Place Value - MC

Which number is equal to 3.02×10^4 ?

- ☐ 0.000302
- ☐ 0.0302
- ☒ 30,200
- ☐ 3,020,000

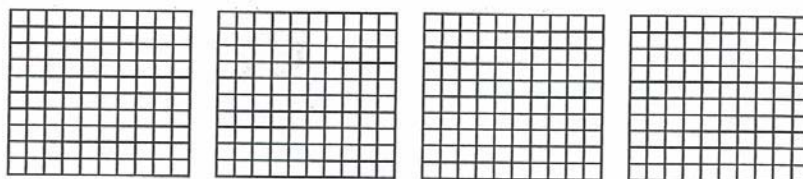
3. Equivalent Fractions, Decimals and Percents - MC

At a school bake sale, $\frac{2}{5}$ of the number of pies sold were apple pies. Which percent is equal to $\frac{2}{5}$?

- ☐ 10%
- ☐ 20%
- ☒ 40%
- ☐ 60%

3. Equivalent Fractions, Decimals and Percents - OE

S-1 Shade in 2.18 of the place-value blocks.



Key: $\square = .01$

4. Order, Magnitude and Rounding of Numbers - MC

Wendal and his 3 friends compared the weights of their backpacks. The group borrowed a scale from their homeroom teacher and measured the weight of the 4 backpacks. The table below shows the results of their measurements.

Backpack Weights

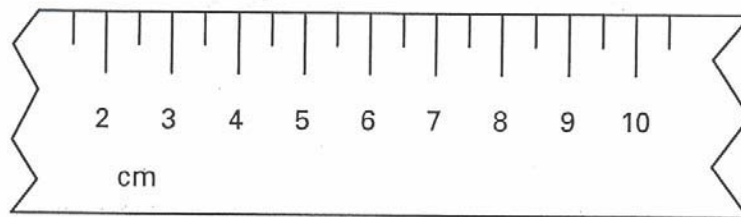
Owner	Weight (in pounds)
Wendal	$17\frac{3}{8}$
Jamie	$17\frac{5}{16}$
Raul	$17\frac{3}{4}$
Mandy	$17\frac{9}{16}$

Who had the heaviest backpack?

- ☐ Wendal
- ☐ Jamie
- ☒ Raul
- ☐ Mandy

4. Order, Magnitude and Rounding of Numbers - OE

S-2 On the ruler below, mark an X at the point where 5.9 cm would be.



5. Models for Operations - MC

A farmer had 15.9 pounds of feed to give to her cows. She had 4 feeding bins she used to feed the cows. If she separated the feed evenly into the 4 bins, which number sentence could be used to determine the amount in one bin, b ?

- ☐ $15.9 \times 4 = b$
- ☒ $15.9 \div 4 = b$
- ☐ $15.9 - 4 = b$
- ☐ $15.9 + 4 = b$

5. Models for Operations - OE

S-3 Write a story problem that can be solved using the number sentence

S3A Write a story problem that can be solved using the number sentence

$$3 \times 8.3 = \square.$$

John, Peter, and Brian decided to combine all their money to get a gift for their parents. If each person had \$8.30, how much money would they have after combining it?

2

S3B Write a story problem that can be solved using the number sentence

$$3 \times 8.3 = \square.$$

Malina had three plastic containers with $8\frac{3}{10}$ pieces of chocolate cake in each. How many pieces of cake does Malina have altogether?

2

S3I Write a story problem that can be solved using the number sentence

$$3 \times 8.3 = \square.$$

Three Dogs met Eight point
three other Dogs and they all
hung out

0

7. Computation with Whole Numbers and Decimals - GR

$$5,006.2 - 2,904.88 =$$

					.		
0	0	0	0	0		0	0
1	1	1	1	1		1	1
2	2	2	2	2		2	2
3	3	3	3	3		3	3
4	4	4	4	4		4	4
5	5	5	5	5		5	5
6	6	6	6	6		6	6
7	7	7	7	7		7	7
8	8	8	8	8		8	8
9	9	9	9	9		9	9

8. Computation with Fractions - MC

$$2\frac{1}{6} + 1\frac{3}{5} =$$

☒ $3\frac{23}{30}$

☐ $3\frac{18}{30}$

☐ $3\frac{4}{30}$

☐ $3\frac{4}{11}$

9. Solve Word Problems - MC

Jerry had $3\frac{1}{2}$ cups of mozzarella cheese and $2\frac{3}{4}$ cups of cheddar cheese to put on 3 pizzas. He also added $1\frac{1}{2}$ cups of Parmesan cheese to the pizzas. In all, how many cups of cheese did he put on the pizzas?

☐ $10\frac{3}{4}$ cups

☒ $7\frac{3}{4}$ cups

☐ $7\frac{1}{4}$ cups

☐ $6\frac{5}{8}$ cups

9. Solve Word Problems - GR

Kwan went shopping for new clothes. He bought 2 shirts for \$18.95 each and 3 pairs of shorts for \$15.50 each. If he gave the cashier \$100, how much change should he get back?

\$

0	0	0	0	0		0	0	
1	1	1	1	1		1	1	
2	2	2	2	2		2	2	
3	3	3	3	3		3	3	
4	4	4	4	4		4	4	
5	5	5	5	5		5	5	
6	6	6	6	6		6	6	
7	7	7	7	7		7	7	
8	8	8	8	8		8	8	
9	9	9	9	9		9	9	

9. Solve Word Problems - OE

S-1 Female gray squirrels generally live longer than male gray squirrels. The table below shows the life spans of 6 squirrels that were part of a study.

Female Squirrels	Life Span	Male Squirrels	Life Span
Daphne	11.3 years	Boomer	8.4 years
Kiwi	9.7 years	Chipper	9.2 years
Peanut	10.5 years	Rocket	7.9 years

According to the table, what was the difference, in years, of the average life span of a female gray squirrel and a male gray squirrel? _____

Show your work or explain how you found your answer.

S11 Female gray squirrels generally live longer than male gray squirrels. The table below shows the life spans of 6 squirrels that were part of a study.

Female Squirrels	Life Span	Male Squirrels	Life Span
Daphne	11.3 years	Boomer	8.4 years
Kiwi	9.7 years	Chipper	9.2 years
Peanut	10.5 years	Rocket	7.9 years

According to the table, what was the difference, in years, of the average life span of a female gray squirrel and a male gray squirrel? 2.9

Show your work or explain how you found your answer.

$$\begin{array}{r} 11.3 \\ - 8.4 \\ \hline 2.9 \end{array}$$

I subtract the female life span to the male.

11. Estimating Solutions to Problems - OE

A stadium can hold 108,400 people. It was about $\frac{3}{4}$ full of people for the last football game of the season.

What is a **good estimate** of the number of people who attended the last game? _____

Explain how you made your estimate.

12. Ratios and Proportions - MC

The ratio of pitchers to catchers at a baseball camp was 11:4. If there were 64 catchers, how many pitchers were at the camp?

- ☐ 44
- ☐ 64
- ☒ 176
- ☐ 256

12. Ratios and Proportions - OE

S-2 An Italian chef made 8 plates of spaghetti for every 3 plates of lasagna.

If she made 78 plates of lasagna, how many plates of spaghetti and lasagna did she make altogether? _____

Show your work or explain how you found your answer.

S2A An Italian chef made 8 plates of spaghetti for every 3 plates of lasagna.

If she made 78 plates of lasagna, how many plates of spaghetti and lasagna did she make altogether? 286

Show your work or explain how you found your answer.

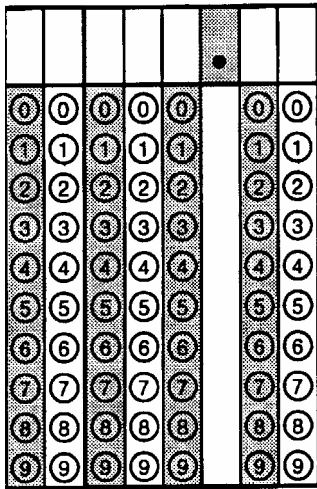
$$\begin{array}{r} 78 \\ \div 3 \\ \hline 26 \\ \times 8 \\ \hline 208 + 78 = 286 \end{array}$$

I divided the total number of plates by 3 getting 26 then I multiplied that by eight to get the lasagna plates then I added the # of lasagna plates to the # of spaghetti plates

2

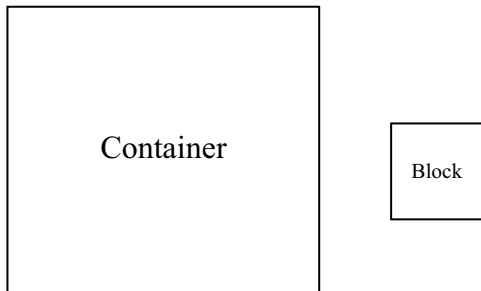
13. Computation with Percents - GR

What is 76% of 56?



15. Approximating Measures - MC

The large square below is the base of a container. The small square is the base of a block.

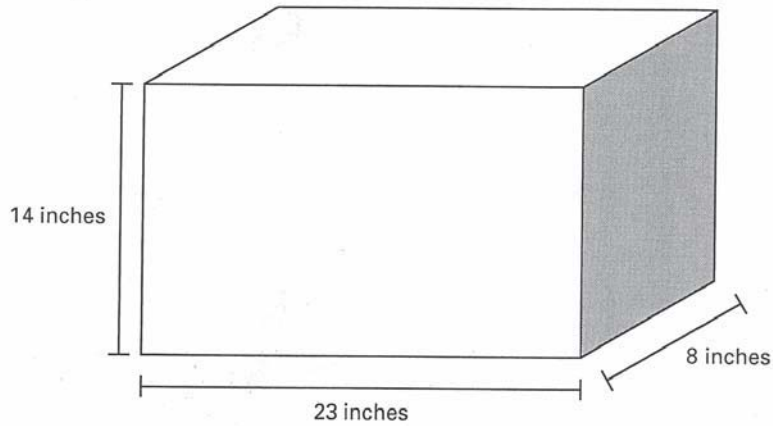


Pablo filled the container evenly to the top with blocks stacked 4 high. Which is the **best** approximation for the number of blocks needed to fill the container evenly?

- ☐ 9
- ☐ 16
- ☒ 36
- ☐ 64

16. Customary and Metric Measures - OE

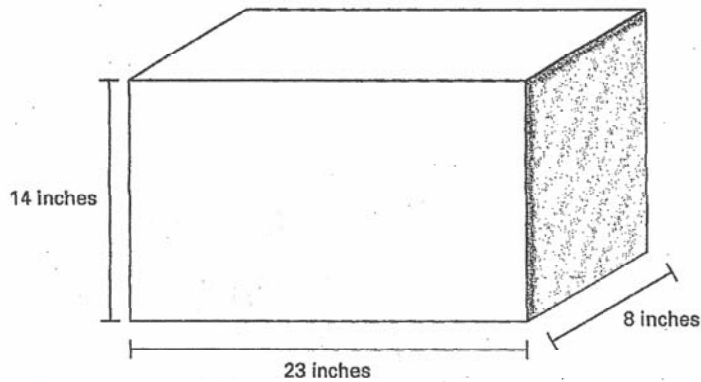
- S-3 Phil made sand art decorations. He had a rectangular container that he filled $\frac{1}{2}$ way full of sand. The picture shows the dimensions of the container.



What is the **volume** of the space that Phil filled with sand? _____

Show your work or explain how you found your answer.

- S3A Phil made sand art decorations. He had a rectangular container that he filled $\frac{1}{2}$ way full of sand. The picture shows the dimensions of the container.



What is the **volume** of the space that Phil filled with sand? 1288 in³

Show your work or explain how you found your answer.

The formula for volume is $L \times W \times H$. ($23 \times 8 \times 14$)
 Following this formula, I got 2576 in³. Since he
 only filled $\frac{1}{2}$ the container, I divided by 2 to get
 1288 in³

2

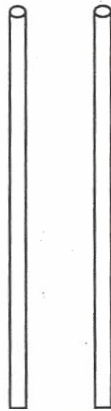
16. Customary and Metric Measures - MC

Eli's car weighs 3,350 pounds. How many **tons** does the car weigh?

- ☐ 0.1675
- ☐ 0.675
- ☒ 1.675
- ☐ 16.75

17. Geometric Shapes and Properties - MC

The picture below shows two flagpoles.

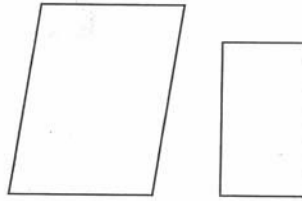


These flagpoles appear to create what kind of lines?

- ☒ **Parallel**
- ☐ **Perpendicular**
- ☐ **Intersecting**
- ☐ **Obtuse**

18. Spatial Relationships - OE

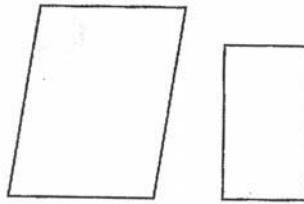
S-7 Barry traced the outline of two different floor tiles. The pictures below show his outlines.



Do the tiles appear to be similar? _____

Explain how you could tell for sure whether or not they are similar.

S7A Barry traced the outline of two different floor tiles. The pictures below show his outlines.



Do the tiles appear to be similar? No

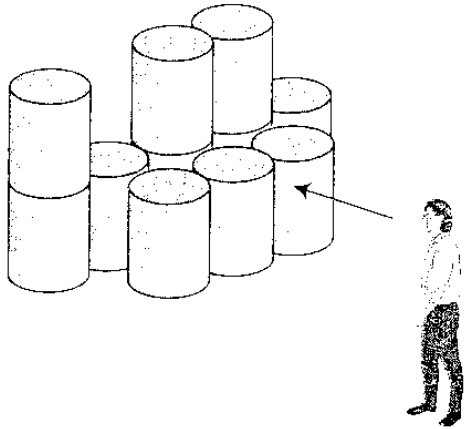
Explain how you could tell for sure whether or not they are similar.

They are not similar because they aren't the same shape. One
has 90° angles and the other doesn't. If two shapes are similar,
the shape is the same but the size is different.

2

18. Spatial Relationships - MC

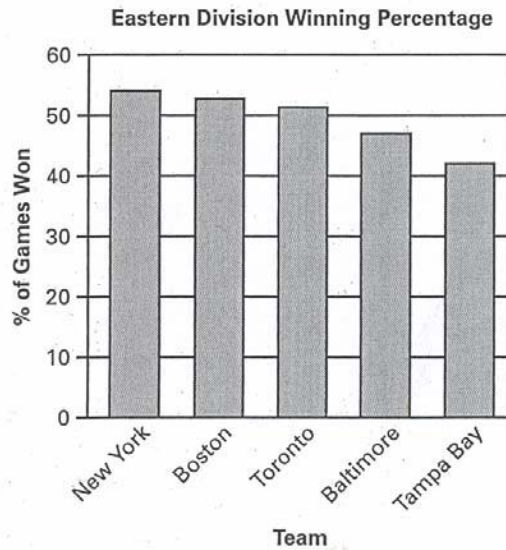
What view of the barrels is seen by the person in the picture?



- ☒
- ☐
- ☐
- ☐

19. Tables, Graphs and Charts - MC

This graph shows the winning percentage during the 2000 Major League Baseball regular season of the Eastern Division of the American League.



The Chicago White Sox, in the Central Division, had a winning percentage of 59%. About how much **greater** was their winning percentage than the percentage of the Boston Red Sox?

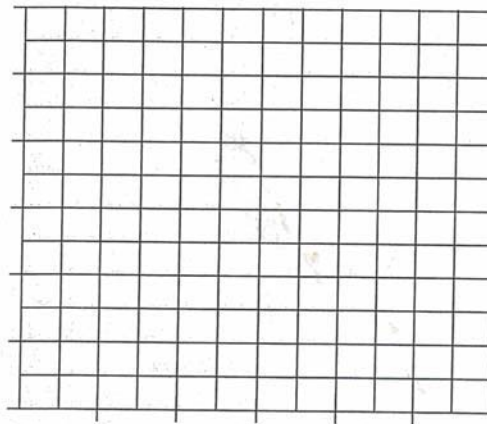
- ☐ 2%
- ☒ 6%
- ☐ 13%
- ☐ 16%

19. Tables, Graphs and Charts - OE

The table shows the number of years ago several kinds of clothing were first worn.

Early Kinds of Clothing	
Kind	Number of Years Ago
Belts and Trousers	30,000
Knitted Skirts	20,000
Cotton	6,500
Silk	5,000
Buttoned Garments	13,000

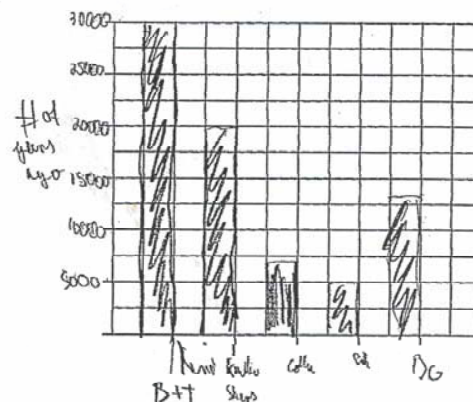
Complete a **bar** graph to show the same information.



S8A The table shows the number of years ago several kinds of clothing were first worn.

Early Kinds of Clothing	
Kind	Number of Years Ago
Belts and Trousers	30,000
Knitted Skirts	20,000
Cotton	6,500
Silk	5,000
Buttoned Garments	13,000

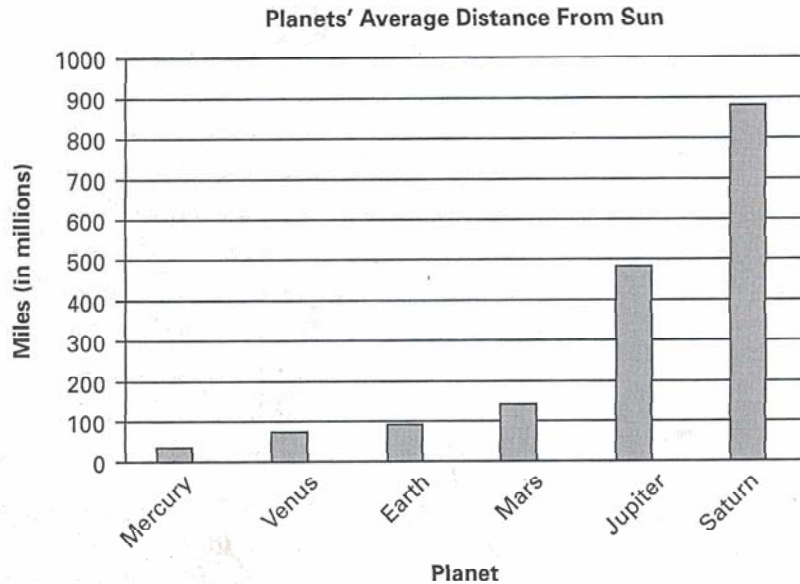
Complete a bar graph to show the same information.



2

20. Statistics and Data Analysis - OE

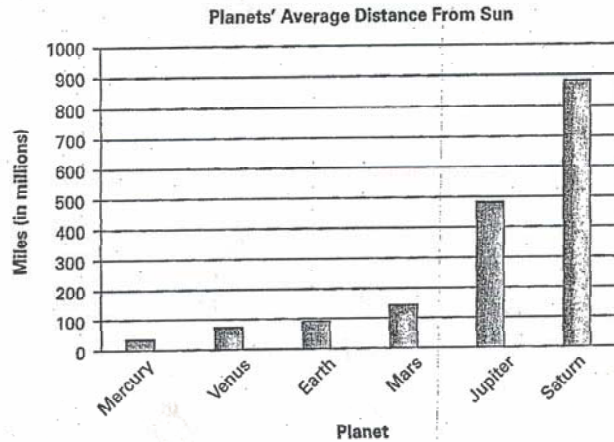
S-4 The graph shows six planets and the number of miles each planet is from the Sun.



Michelle claims that Jupiter is about 3.4 times farther than Mars is from the Sun.

Based on the graph, is Michelle's claim **reasonable**? Write an explanation to show why you agree or why you do not agree with Michelle's claim.

S4A The graph shows six planets and the number of miles each planet is from the Sun.



Michelle claims that Jupiter is about 3.4 times farther than Mars is from the Sun.

Based on the graph, is Michelle's claim **reasonable**? Write an explanation to show why you agree or why you do not agree with Michelle's claim.

Yes, Mars is about 150 million miles away.
 Multiply that by 3.4 and you would get 510.
 Jupiter looks about 490, so her explanation is
 not bad.

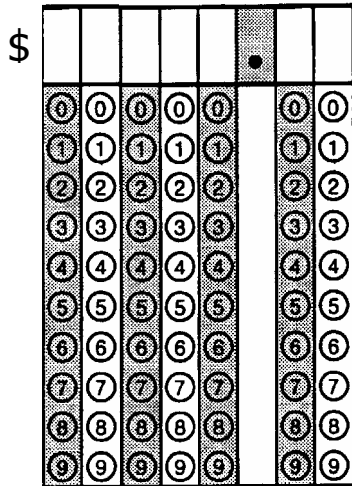
2

20. Statistics and Data Analysis - GR

Louis works at a supermarket. His earnings from his last four paychecks are shown below.

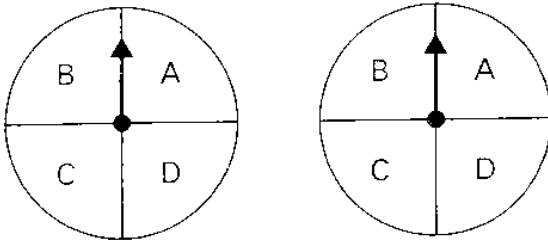
\$187.53	\$168.76
\$205.64	\$252.71

What is the **mean** of Louis' earnings from these four paychecks?



21. Probability - MC

The spinners below are each divided into 4 equal sections



If each spinner is spun once, what is the probability that the arrows will **both** land on A?

- | | |
|---|--------------------------------------|
| <input type="radio"/> $\frac{1}{4}$ | <input type="radio"/> $\frac{2}{16}$ |
| <input checked="" type="radio"/> $\frac{1}{16}$ | <input type="radio"/> $\frac{2}{4}$ |

21. Probability - OE

- S-4 Bob was playing a game with his best friend, Jose. Jose would toss 2 coins at the same time. Jose would get a point each time the coins came up with one heads and one tails. Bob would get a point each time the coins came up either both heads or both tails.

Is this game fair? _____

Explain why or why not using the outcomes of tossing 2 coins.

S4A Bob was playing a game with his best friend, Jose. Jose would toss 2 coins at the same time. Jose would get a point each time the coins came up with one heads and one tails. Bob would get a point each time the coins came up either both heads or both tails.

Is this game fair? Yes

Explain why or why not using the outcomes of tossing 2 coins.

Yes, I think that the game is fair because
it is a 50% chance that the coins will land on
1 heads and 1 tails or both heads and both
tails.

2

S4B Bob was playing a game with his best friend, Jose. Jose would toss 2 coins at the same time. Jose would get a point each time the coins came up with one heads and one tails. Bob would get a point each time the coins came up either both heads or both tails.

Is this game fair? Yes

Explain why or why not using the outcomes of tossing 2 coins.

If Bob get ~~one~~ two heads or two tails,
It is two ways of winning.
If Jose gets 1 heads, 1 tails, 1 tails, 1 heads.
It is two ways of winning.

2

S4I Bob was playing a game with his best friend, Jose. José would toss 2 coins at the same time. Jose would get a point each time the coins came up with one heads and one tails. Bob would get a point each time the coins came up either both heads or both tails.

Is this game fair? no

Explain why or why not using the outcomes of tossing 2 coins.

This is unfair because by tossing two coins
Bob has an advantage if he wins by these
terms. Bob has a much greater chance of
winning

0

22. Patterns - MC

The numbers below follow a pattern.

12, 24, 48, 96, __, __, __, __, __, ?

What is the 10th term in the pattern?

- ☒ 6144
- ☐ 5744
- ☐ 3072
- ☐ 192

22. Patterns - OE

S-3 These numbers follow a pattern.

610, 510, 420, ?, ?, 210, 160

Which numbers are missing? _____

Explain why you think they are the missing numbers.

S3A These numbers follow a pattern.

610, 510, 420, ?, ?, 210, 160

Which numbers are missing? 340, 270

Explain why you think they are the missing numbers.

I subtracted 510 from 610 to get 100. Then I subtracted 420 from 510 to get 90. I realized the pattern is subtract 10 less than the number you subtracted before. So from 420 I subtracted 80 to get 340, and subtracted 70 from 340 to get 270. From 270 I subtracted 60 and got 210, so I know my answer is correct.

2

S3B These numbers follow a pattern.

610, 510, 420, ?, ?, 210, 160

Which numbers are missing? 340, 270

Explain why you think they are the missing numbers.

$610 - 100 = 510$ $510 - 90 = 420$ $420 - 80 = 340$ $340 - 70 = 270$
 $270 - 60 = 210$ $210 - 50 = 160$

2

S31 These numbers follow a pattern.

610, 510, 420, ?, ?, 210, 160

Which numbers are missing? 410, 320

Explain why you think they are the missing numbers.

I went by 105

0

23. Algebraic Concepts - GR

What is the value of x in this equation?

$$2x - 4.01 = 7.13$$

0	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9

23. Algebraic Concepts - OE

S-6 Jenny has a collection of baseball and football cards. For every 5 baseball cards in the collection, there are 2 football cards.

If Jenny has a total of 133 cards in her collection, how many baseball cards does she have? _____

Show how you could use the table below to solve the problem.

Baseball	Football	Total
5	2	7

S6A Jenny has a collection of baseball and football cards. For every 5 baseball cards in the collection, there are 2 football cards.

If Jenny has a total of 133 cards in her collection, how many baseball cards does she have? 95

Show how you could use the table below to solve the problem.

Baseball	Football	Total
5	2	7
10	4	14
15	6	21
20	8	28
25	10	35
30	12	42

95 38 133

2

23. Algebraic Concepts - MC

Wendy was a painter. She paid \$14.00 for each gallon of paint she bought. She also bought a new brush for \$4.99. If x represents the number of gallons of paint she bought, which expression shows the amount of money she spent on paint and the brush?

- ☐ $14 - 4.99x$
- ☐ $14x - 4.99$
- ☐ $14 + 4.99x$
- ☒ $14x + 4.99$

24. Classification and Logical Reasoning - MC

The following are clues to Carmen's age.

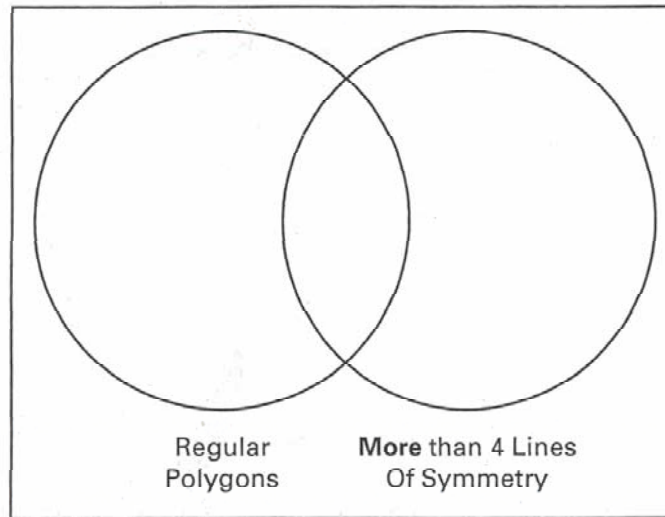
- It is an odd number greater than 10 but less than 22.
- It is **not** a prime number.
- It is **not** divisible by 5.

What is Carmen's age?

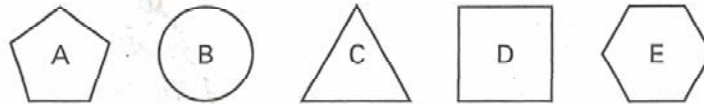
- ☐ 15
- ☐ 17
- ☒ 21
- ☐ 23

24. Classification and Logical Reasoning - OE

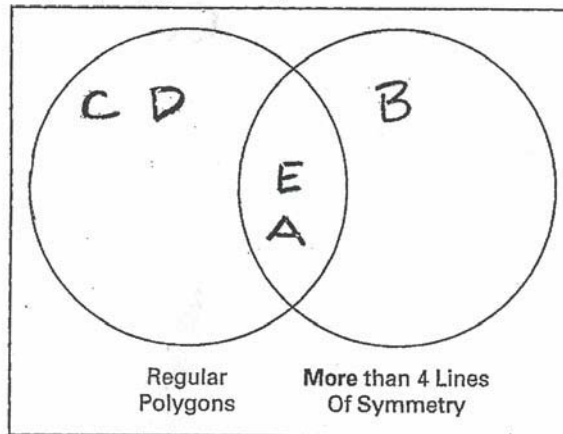
S-5 Use the Venn diagram to help you sort shapes.



Write the **letter** of each shape below into the appropriate set in the Venn diagram.



S5A Use the Venn diagram to help you sort shapes.



Write the letter of each shape below into the appropriate set in the Venn diagram.



2

25. Mathematical Applications

E-1 The Bushnell Park Carousel in Hartford opens in early May and runs through October from 11 A.M. to 5 P.M. One cycle of the carousel consists of 3 stages: loading people, the actual ride, and unloading people. It takes about 8 minutes to complete one cycle. The actual ride on the carousel takes $3\frac{1}{2}$ minutes.

If the carousel rotates 4 times per minute, how many rotations could it make from 11 A.M. to 5 P.M.? _____

Show your work or explain how you found your answer.

E1A The Bushnell Park Carousel in Hartford opens in early May and runs through October from 11 A.M. to 5 P.M. One cycle of the carousel consists of 3 stages: loading people, the actual ride, and unloading people. It takes about 8 minutes to complete one cycle. The actual ride on the carousel takes $3\frac{1}{2}$ minutes.

If the carousel rotates 4 times per minute, how many rotations could it make from 11 A.M. to 5 P.M.? 630

Show your work or explain how you found your answer.

$$4 \text{ rotations/minute} \times 3\frac{1}{2} \text{ minutes} = 14 \text{ rotations}/3\frac{1}{2} \text{ minutes}$$

$$60 \text{ mins} \div 8 \text{ mins per cycle} = 7.5 \text{ cycles/hour}$$

$$14 \text{ rotations/cycle} \times 7.5 \text{ cycles/hour} = 105 \text{ rotations/hour}$$

$$105 \text{ rotations/hour} \times 6 \text{ hours} = 630 \text{ rotations in 6 hours}$$

3