

## Math Trivia

H ow many rectangles are in this shape?
Remember, squares are rectangles.

(3.01)


Using Numbers in Powerful Ways
The perimeter of a rectangular patio is six times the length of the shorter side. If the shorter side is 8 feet, what is the length of the longer side?

(1.03, 5.02)

## $\left[\begin{array}{rl}{[8]} \\ 3 \\ 3\end{array}\right]$ Investigations

W hen you play Gazinto, what numbers are good choices to cover? W hat strategies do you use to try to win?

(Division Review)


## Fraction Fun

W ithout adding or subtracting, how can you prove these are incorrect?

$$
\begin{array}{ll}
\frac{5}{6}+\frac{1}{4}=\frac{6}{10} & \frac{4}{8}-\frac{1}{2}=\frac{3}{6} \\
\frac{9}{12}-\frac{1}{4}=\frac{8}{8} & \frac{3}{5}+\frac{4}{5}=\frac{7}{10}
\end{array}
$$



A diagonal connects two non-adjacent verticies of a polygon. Do all octogons have the same number of diagonals? H ow do you know?

## Gazinto

You need: Pencil and paper to keep score; Gameboard for 2 to 4 players; 10 counters each (a different color for each player); a number cube

Rules: Players take turns placing a counter on the board, then rolling the cube. Divide the number on the cube into the number just covered. The remainder is the score. Once a number has been covered, it cannot be used again. The game is over after 10 rounds. The winner is the person
 with the highest total.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

Opportunity: Design a variation of this game which practices division and allows for strategies. Make your game available for others to use.
(Division review)

\section*{| $2 \alpha_{3}^{4}$ |  |
| :--- | :--- |
| 1 | 3 | Keeping Skills Shapp}

1. $<,>$, or $=: 23,765$ $\qquad$ 23,657
2. About how many hundreds? $1,894+1470$
3. If Mari earns $\$ 40$ a week, how much will she earn in 6 weeks?
4. $246+875+351$
5. $508-149$
6. $(9 \times 8)+3=$ ?
7. A blimp can travel at 30 miles per hour. A hot air balloon travels at 9 miles per hour. How much faster is the blimp?
8. If a jet plane can travel at 460 miles per hour, how far can it travel between 8:00 a.m. and 10:00 a.m.?

How many syllables are there in the song "Happy Birthday" when the birthday person has a two-syllable name?


Solve This: Suggested Strategy- look for a pattern.
Math Trivia: 30 rectangles

Mental Math
Directions to Students: Number your paper from 1 to 10 . Write your answers as the questions are called out. Each question will be repeated only once.

1. $5 \times 4 \div 2+7$
2. $8 \times 5 \div 10+9$
3. Word form for: 560
4. Round to nearest hundred: 738
5. Only number neither prime nor composite
6. Number of sides on an octagon
7. Weight of paperclip: gram or kilogram
8. Number of feet in a yard
9. Value of 15 dimes
10. Number of yards for a football field

## Keeping Skills Sharp

1. $>$
2. 359
3. 350
4. $\$ 240$
5. 1472
6. 75
7. 21 mph
$8 \quad 920 \mathrm{mi}$.

## Math Trivia

Using the digits, 1, 4, 5, and 8 how many numbers greater than 500 can be made? [ $N$ o number can repeat any digits.]
W hat is the probability that a number made is greater than 1000? divisible by three? by six? by nine?
Which is more likely an even or an odd number?
Are there any square numbers?


## Using Numbers in Powerful Ways

If arectangleand a squarehavethesameperimeter but different areas, which has the smaller area?

Verify your answer testing the area of several rectanglesand squaresthathavethesameperimeter.


## Investigations

Find all numbers between 200 and 300 that are divisible by 2,3 , and 5 . Write the strategies and rules for divisibility that you used to justify your choices.
(Division review)


## Fraction Fun

If half a boogle is equal to one-third of a koogle but twice as big as a doogle which is larger:

3 boogles or 5 doogles?

4 doogles or 1 boogle?

2 koogles or $2 \frac{1}{2}$ boogles?
4 boogles or 3 koogles?
(1.01c, 1.03, 5.02)

## 

Estimation is helpful in many ways. It can be useful before, during, and after you solve a problem. When do you find estimation most helpful? Explain how estimation can help you.

Two players need a calculator, two number cubes, and pencil and paper to record scores. The flow chart below gives the directions for play. Each round uses a different target. The goal is to get a product within the designated range. The winner is the player with the most points at the end of 7 rounds.



Target 2: 3 points


Target 3: 2 points


Target 6: 3 points


Target 1: 4 points


Target 4: 3 points


Target 5: 4 points


Target 7: 4 points


## ${ }_{1 / 3}^{2 \pi}$ Keeping Skills Sharp

1. $3801-1912$
2. $962 \div 3$
3. $6942+438$
4. The Lopez family plans to travel 1045 miles. If they drive 335 miles each day, can they reach their destination in 3 days?
5. As the denominator increases, the fractional pieces become
$\qquad$ _.
6. Write these numbers from least to greatest: $286,682,628,268$
7. $\$ 5-\$ 1.08$
8. What part is shaded?


## . Solve this!

If you could fold a piece of paper in half nine times, how many sections would there be?

If you could fold it 20 times, how many sections would there be?

Experiment: How many times can you fold a paper in half? Does the size of the paper matter? Does the thickness matter?


## Using Numbers In Powerful Ways

rectangle

## Investigation Answer:

$210,240,+270$ ( 300 would not be included because it is not between 200 and 300.). Have students share strategies as to how they solved this. Students should automatically know the \# is even since it is divisible by 2 , so it can't end in 5 . It has to be a multiple of 10 because it is divisible by 5 . Then there are only 9 numbers to test by 3 .

## Solve this:

| \# of folds | \# of layers |
| :---: | :---: |
| 0 | 1 |
| 1 | 2 |
| 2 | 4 |
| 3 | 8 |
| 4 | 16 |
| 5 | 32 |
| . | 512 |
| 9 | $\cdot$ |
| . | $1,048,576$ |
| 20 | $\cdot$ |
| $\cdot$ | $2^{\mathrm{n}}$ |

Suggested Strategies: Use manipulatives or objects.
Fraction Fun: Pattern blocks make good models for this problem. The blue parallelogram is a boogle, thetrapezoid is a koogle and the triangle can represent a doogle.

Mental Math

1. $(14-6) \times 3$
2. $(17-8) \times 4$
3. Expanded form for: 909
4. Round to nearest hundred: 961
5. Factors of 12
6. Two lines that intersect at right angles
7. Height of teacher: more or less than two meters
8. Number of inches in a yard
9. Number in two dozen
10. Value of 3 quarters and 4 pennies

## Keeping Skills Sharp

1.1889
2. 320 R 2
3.7380
4. No
8. $12 / 16$ or $3 / 4$
(1005 miles)


## Math Trivia

W illiam 0 ughtred (1574-1660), an English mathematician, invented a symbol for times ( $\mathbf{x}$, but many opposed it because they thought it would be confused with the letter $x$.

Gottfried W ilhelm von Leibnitz (1646-1716) adopted the raised dot (•) for multiplication.

In 1557, Robert Recorde devised the equal sign (=) because parallel lines were objects that were most alike and denoted equality.


Using Numbers in Powerful Ways
A line graph plots continuous data. Collect data for the temperature for every hour this week (either morning/afternoon temperature from
8 a.m. - 2 p.m. or
afternoon/evening
temperature (3 p.m. - 9 p.m.)
(4.01)


## Investigations

Venn Diagrams are useful in displaying data. Gather information in your class to make Venn D iagrams showing:

- people wearing tennis shoes
- people wearing belts
- students who like spinach
- students who like carrots
- students who ride the bus to school
- students who bring their lunches

Create other data sets and display them in Venn Diagrams. For each one be prepared to explain what information you can tell from the display.
(Venn diagram review)


## Fraction Fun

W ithout computing, which whole number is closest to
$49.2 \div 4.9$ ?
8.4-0.97?
$5.01 \div 9.03 ?$
$3.99 \times 0.99 ?$
$2.9 \times 16.2 ?$
$50.2+1.98 ?$

## For Further Study

W ho is credited with developing the Venn diagram?

## Strategy Plus

1 gameboard for 2 players and 2 paper clips; 15 different colored markers per player


Directions: Player \#1 places the paper clips on two numbers at the bottom of the page and multiplies or divides, placing a marker on the results. Player \#2 can move only one paper clip. This player multiplies or divides and covers the results. The game continues as players take turns and move only one paper clip before computing. To win: Cover 4 in a row.
(Multiplication review)

| 72 | 5 | 36 | 9 | 25 | 49 | 1 |
| ---: | ---: | ---: | ---: | ---: | ---: | ---: |
| 60 | 45 | 10 | 21 | 2 | 54 | 14 |
| 7 | 20 | 42 | 16 | 40 | 24 | 50 |
| 3 | 48 | 81 | 100 | 18 | 30 | 8 |
| 80 | 15 | 35 | 27 | 64 | 2 | 28 |
| 63 | 6 | 70 | 4 | 32 | 56 | 12 |

# $\begin{array}{lllllllll}2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 & 10\end{array}$ 

## ${ }_{1 / 3}^{2 \pi}$ Keeping Skills Sharp

1. $124 \times 8$
2. $\$ 35.06-\$ 18.21$
3. $52+4006+1285+9$
4. Iris needs 110 plastic spoons for a party. There are 24 in a box.

Will 5 boxes be enough?
5. Draw a line segment that is 12 cm long.
6. Draw a quadrilateral with a perimeter of 20 cm .
7. Would a banana weigh 7 ounces or 7 pounds?
8. Paula's scarf has stripes on it. The first stripe is green, the second is black, and the third stripe is white. If this pattern continues, what color is the 10th stripe.

Solve this!
A traffic light at one intersection changes every 28 seconds.

The traffic light at the next intersection changes every 32 seconds
How long before they will both change together?


## Venn Diagrams:

You may want to begin talking about Venn Diagrams with your class by playing the "Guess My Rule" game. In this game, the teacher picks a rule; e.g., wearing a watch. Then the teacher picks one student that fits the rule to stand in the front of the class and one that doesn't fit the rule to stand in the back of the room. The students are allowed to "guess the rule" only by asking if others in the class fit the rule. As students fit they join the front. If they do not fit, then they must stand in the back of the room.

Students that are standing may also guess. Allow a student to verbally tell you the rule only if they can identify whether each student in the class fits or not. After they have played a few times, you may want to choose 2 rules. You can make an actual Venn Diagram on the floor for the students to move into if they fit one or both rules. This activity is crucial for students to realize they need to pay attention to what is placed outside of the Venn Diagram. Most students will ignore the students in the back of the room instead of using them to help determine the rule.

## Solve This:

They will both change together in 224 seconds or 3 minutes and 44 seconds.

| Traffic Light \# 1 | Traffic Light \# 2 |
| :---: | :---: |
| 28 seconds | 32 seconds |
| 56 seconds | 64 seconds |
| 84 seconds | 96 seconds |
| 112 seconds | 128 seconds |
| 140 seconds | 160 seconds |
| 168 seconds | 192 seconds |
| 196 seconds | 224 seconds |
| 224 seconds |  |

Mental Math
Directions to Students: Number your paper from 1 to 10 . Write your answers as the questions are called out. Each question will be repeated only once.

1. $(7 \times 7+1) \div 10$
2. $(7 \times 6+3) \div 9$
3. Expanded form for 1576
4. Round to nearest hundred: 327
5. Factors of 17
6. The name of an angle between 90 and 180
7. Centimeters in 3 meters
8. Cups in a pint
9. 3 dimes, half-dollar, 5 pennies
10. The date for 2 weeks after October 5th

## Keeping Skills Sharp

1. 992
2. check
3. $\$ 16.85$
4. 5352
5. Yes
(120 spoons)
