

Praxis Review Workshop: Core Mathematics Exam Part I

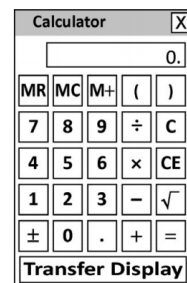
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REACH Math Resources



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Exam Overview – “Old” (5732)

- Core Academic Skills for Educators: Mathematics
- **85** minutes to complete **56** questions (about 1.5 minutes per question!)
- Multiple-choice, selected-response (with one or more answers), and short-answer questions
- On-screen calculator



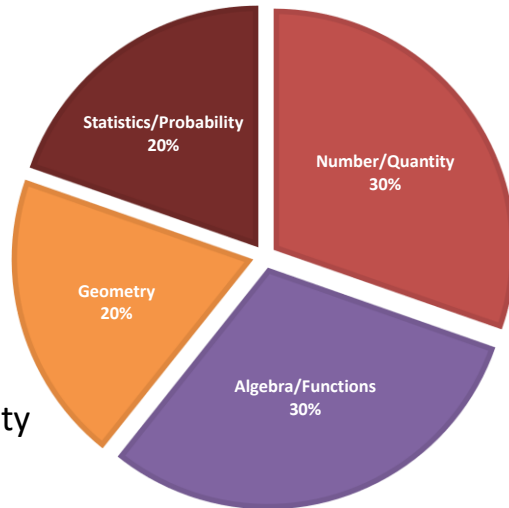
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Exam Overview – “Old” (5732)

CONTENT AREAS

- Number & Quantity
(17 questions)
- Algebra & Functions
(17 questions)
- Geometry
(11 questions)
- Statistics & Probability
(11 questions)

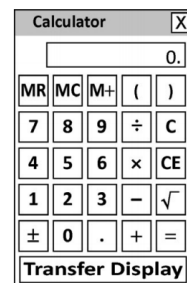


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Exam Overview – “New” (5733)

- Core Academic Skills for Educators: Mathematics
- **90** minutes to complete **56** questions (about 1.6 minutes per question!)
- Multiple-choice, selected-response (with one or more answers), and short-answer questions
- On-screen calculator



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Exam Overview – “New” (5733)

CONTENT AREAS

I. Number & Quantity: +3

(20 questions)

II. Data, Statistics, & Probability: +7

(18 questions)

III. Algebra & Geometry: -10

(18 questions)



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Exam Overview

THIS WEEK

- Number & Quantity
- Statistics & Probability (& Data)

NEXT WEEK

- Algebra & Functions
- Geometry

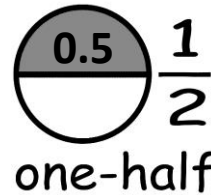


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Number & Quantity: Major Topics

- Order of operations
- Fractions (e.g., ordering)
- Operations involving integers
- Operations involving fractions, decimals, and percents
- Ratios/proportions
- Percents (including percent inc/dec)
- Basic number theory (e.g., factors)
- Interpreting charts and graphs
- Area models, etc.
- Unit conversions
- Scientific notation
- Powers and roots (e.g., square roots)
- Estimation



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Number & Quantity

1. What is the least common denominator of the following fractions: $\frac{2}{3}$, $\frac{3}{4}$, $\frac{5}{6}$?

A. 6
B. 12
C. 24
D. 30
E. 62

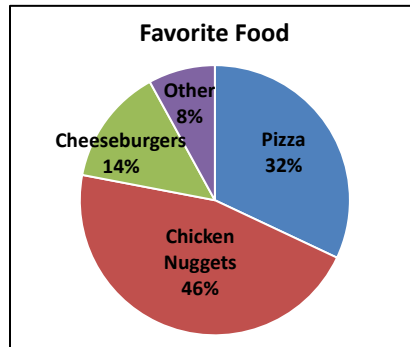
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Number & Quantity

2. Some kindergarten students were asked to give their favorite food. The results for 350 students are shown below. How many more students chose chicken nuggets than pizza?

- A. 14
B. 25
C. 49
D. 56
E. 140



9

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Number & Quantity

3. What is the distance between $-\frac{2}{3}$ and $\frac{3}{4}$ on the number line?

- A. $-\frac{1}{2}$
B. $\frac{1}{12}$
C. $\frac{6}{7}$
D. $\frac{17}{12}$
E. $\frac{12}{7}$



10

10

Number & Quantity

4. Two buses arrive at Grand Central Station at 11:30 a.m. The first bus arrives at the station every 45 minutes, while the second bus arrives at the station every 20 minutes. When is the next time that both buses will arrive at this station at the same time?
- A. 1:00 p.m.
 B. 2:30 p.m.
 C. 3:30 p.m.
 D. 4:00 p.m.
 E. 5:30 p.m.

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Number & Quantity

5. Which of the following problems can be solved using the area model below?

A. $\frac{2}{3} \times \frac{1}{6}$

B. $\frac{2}{3} \div \frac{1}{6}$

C. $\frac{2}{3} \times 4$

D. $\frac{2}{3} \div 6$

- E. None of these



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Number & Quantity

6. Using the table, determine how many cups are in $3\frac{1}{2}$ gallons?

- A. 3.5 cups
- B. 14 cups
- C. 28 cups
- D. 42 cups
- E. 56 cups

<p>1 cup = $\frac{1}{2}$ pint</p> <p>2 pints = 1 quart</p> <p>4 quarts = 1 gallon</p>
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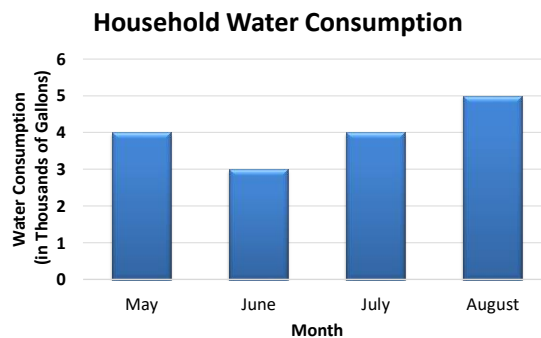
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Number & Quantity

7. One family's water consumption (in thousands of gallons) over several months is shown in the bar graph below. What was the percent increase in water consumption from June to August?

- A. 2 %
- B. 20 %
- C. 40 %
- D. 66.7 %
- E. 100 %



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Number & Quantity

8. Which of the following numbers are greater than 3?

i. $\sqrt{2}$

ii. $\sqrt{3}$

iii. $\sqrt{9}$

iv. $\sqrt{10}$

v. π

A. *i* and *ii*

B. *i*, *ii*, and *iii*

C. *iii*, *iv*, and *v*

D. *iv* and *v*

E. None of them

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Number & Quantity

9. The ratio of female to male students in a class is 7:2. If there are 12 males in the class, what is the total enrollment?

A. 17 students

B. 29 students

C. 42 students

D. 54 students

E. 84 students

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Statistics & Probability: Major Topics

- Statistical questions
- Random sampling
- Measures of center (mean, median, mode)
- Measures of spread (range)
- Weighted average
- Representing data and understanding data representations
- Interpreting diagrams (e.g. scatterplot)
- Probability of simple events
- Independent and dependent events

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Statistics & Probability

1. A laundry basket contains some brown and black socks. In particular, there are 12 brown socks in the basket. If the probability of randomly drawing a black sock from the basket is $\frac{1}{4}$, how many black socks are in the basket?

A. 3
B. 4
C. 6
D. 9
E. 16

18

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Statistics & Probability

2. Which of the following is NOT a statistical question?
- A. How many hours per week do college students do homework?
 - B. Do female students spend more time on homework than male students?
 - C. Do elementary-school teachers work more hours per year than high-school teachers?
 - D. On average, how many years do teachers remain in the profession?
 - E. How many teachers in Kentucky have tenure?

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Statistics & Probability

3. The table below shows the number of children in 50 randomly selected families in the U.S. What is the average number of children per family in this random sample?

- A. 1.72
- B. 1.86
- C. 2.05
- D. 3
- E. 3.5

Number of Children	Number of Families
0	8
1	12
2	21
3	6
4	2
5	0
6	1

20

20

Statistics & Probability

4. If two cards are drawn from a standard deck, what is the probability that both cards will be spades? (Note that there are 52 cards in a standard deck, and one-fourth of them are spades.)
- A. $\frac{3}{52}$
 - B. $\frac{3}{51}$
 - C. $\frac{1}{16}$
 - D. $\frac{1}{4}$
 - E. $\frac{1}{2}$

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Statistics & Probability

5. The dotplot below shows the number of hours of sleep reported by 14 people on a given night. What is the mean and median number of hours, respectively (rounded to the nearest tenth)?

Test Tip 10:

Be sure to review the most common representations of data, including dot plots, scatterplots, box plots, and histograms.

- A. 7.4 hours; 7 hours
- B. 7.4 hours; 7.5 hours
- C. 7.4 hours; 8 hours
- D. 7 hours; 7.4 hours
- E. 8 hours; 7.4 hours

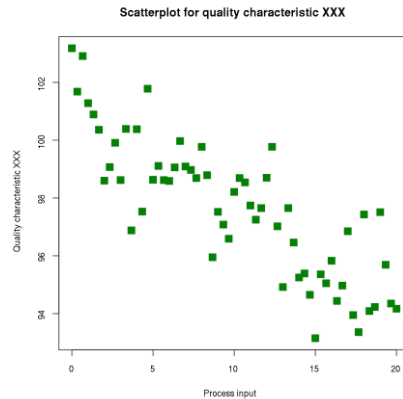
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Statistics & Probability

6. Which of the following statements best describes the association of the variables in the scatterplot below?

- A. Nonlinear association
- B. Positive linear correlation
- C. Negative linear correlation
- D. Strong correlation
- E. No correlation



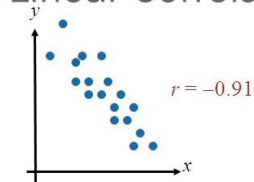
Tip: Representations

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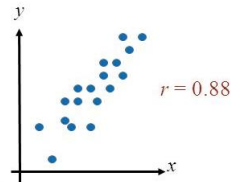
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Statistics & Probability

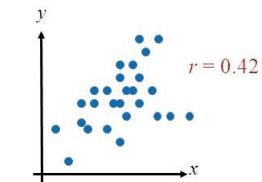
Linear Correlation



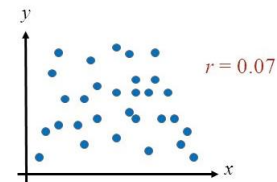
Strong negative correlation



Strong positive correlation



Weak positive correlation



Nonlinear Correlation

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Statistics & Probability

7. In a certain game, players must roll two (2) six-sided dice at the beginning of each turn. At any given time, what is the probability that a player will roll a sum of 8?

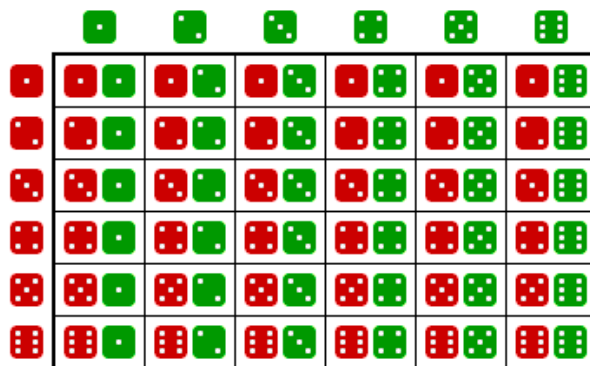
- A. $1/36$
- B. $1/11$
- C. $1/9$
- D. $5/36$
- E. $1/6$

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Statistics & Probability

In a certain game, players must roll two (2) six-sided dice at the beginning of their turn. At any given time, what is the probability that a player will roll a sum of 8?



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Statistics & Probability

8. A certain company has both part-time and full-time employees; only full-time employees receive health benefits. The company CEO is interested in surveying a group of employees to determine their level of satisfaction with the current insurance carrier. Which method would most likely produce a sample that is representative of the population of interest and be practical to implement?
- A. Supervisors select several employees in their area to be surveyed.
 - B. A random sample of all employees is selected.
 - C. All employees are surveyed.
 - D. Surveys are mailed to all full-time employees and returned surveys are used as the sample.
 - E. Every full-time employee is assigned a number and names are randomly drawn from a hat to select participants.

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Homework

- Check out the great resources available from ETS!
 - Google: “Praxis CASE Math”
 - Direct link: <https://www.ets.org/praxis/prepare/materials/5732> (and **5733**)
- Attempt the sample mathematics problems **in this handout** and from the *Praxis Study Companion*.

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Math Resource Center

UofL student? Need additional help?

Visit the REACH Math Resource Center!

<https://reach.louisville.edu/tutoring/>



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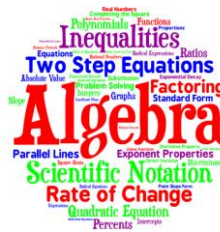
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Looking Ahead

Next Friday

- Algebra & Functions
- Geometry

- Questions?

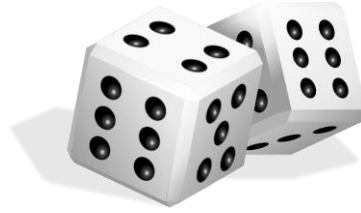
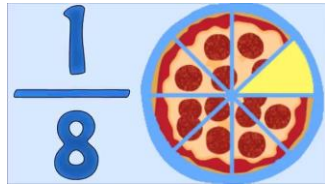


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Additional Practice

Here are some additional practice problems related to **Number & Quantity** and **Statistics & Probability**!



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Number & Quantity

1. On a certain map, the scale reads 2 inches = 3 miles. If two cities are 14 inches apart on the map, how far apart are the cities actually located from each other? (If necessary, round to the nearest mile.)

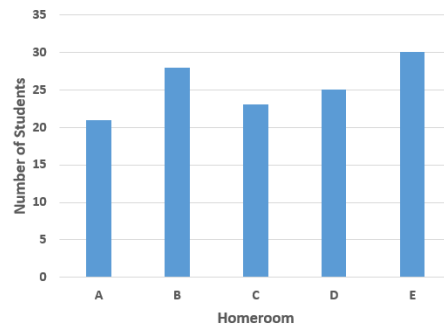
A. 9 miles
B. 15 miles
C. 21 miles
D. 42 miles
E. 84 miles

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Number & Quantity

2. All 5th grade students at Anytown Elementary are going on a school trip. The bar graph below shows the number of students in each 5th grade homeroom. If the maximum capacity of Anytown's school buses is 54, how many buses will be needed for the trip?



- A. 1
 B. 2
 C. 3
 D. 4
 E. None of these

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Number & Quantity

3. A recipe for Peanut Butter Blossoms calls for $1\frac{3}{4}$ cups of flour. How much flour would be needed to make half of this recipe?

- A. $\frac{3}{8}$ cup
 B. $\frac{5}{6}$ cup
 C. $\frac{7}{8}$ cup
 D. $\frac{7}{4}$ cups
 E. $\frac{7}{2}$ cups

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Number & Quantity

4. The average distance from the Earth to the Sun is about 9.3×10^7 miles, or 1 Astronomical Unit (AU). The planet Neptune is about 30 AU from the sun. How far is this distance in miles?

- A. 9.3×10^{37}
- B. 9.3×10^{210}
- C. 2.79×10^5
- D. 2.79×10^7
- E. 2.79×10^9

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Number & Quantity

5. Which of the following mathematical expressions can be used to solve the problem below?

There are eight slices in each Mama Jane's pizza. If I have $2\frac{1}{2}$ Mama Jane's pizzas, how many total slices do I have?

- A. $2\frac{1}{2} \div \frac{1}{8}$
- B. $2\frac{1}{2} \times \frac{1}{8}$
- C. $2\frac{1}{2} - \frac{1}{8}$
- D. $2\frac{1}{2} \div 8$
- E. None of these

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Number & Quantity

6. Place the following fractions in order from least to greatest:

$$-\frac{4}{7}, -\frac{1}{2}, -\frac{11}{7}, -\frac{11}{8}$$

- A. $-\frac{4}{7}, -\frac{1}{2}, -\frac{11}{7}, -\frac{11}{8}$
 B. $-\frac{1}{2}, -\frac{4}{7}, -\frac{11}{7}, -\frac{11}{8}$
 C. $-\frac{1}{2}, -\frac{4}{7}, -\frac{11}{8}, -\frac{11}{7}$
 D. $-\frac{11}{8}, -\frac{11}{7}, -\frac{4}{7}, -\frac{1}{2}$
 E. $-\frac{11}{7}, -\frac{11}{8}, -\frac{4}{7}, -\frac{1}{2}$

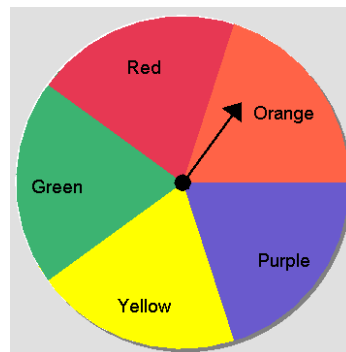
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Statistics & Probability

7. If a person flips a coin and spins the spinner below, what is the probability that the coin will land on "heads" **and** the spinner will land in the orange region?

- A. $\frac{1}{25}$
 B. $\frac{1}{10}$
 C. $\frac{1}{5}$
 D. $\frac{1}{4}$
 E. $\frac{1}{2}$



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Statistics & Probability

8. In a certain class, students take five tests. Natalie earned the following scores on her first four tests: **81, 86, 95, and 91**, respectively. How many points does Natalie need to earn on her fifth test to have an overall test average of 90%?

- A. 7
- B. 83
- C. 92
- D. 95
- E. 97

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Statistics & Probability

9. An American roulette wheel contains 38 numbered pockets. Two are green, 18 are red, and 18 are black. The results of the first four spins of a roulette wheel are recorded: black, red, black, black. What is the probability that the ball will land in a black pocket on the next spin?

- A. $9/19$
- B. $1/2$
- C. $3/4$
- D. $9/10$
- E. None of these

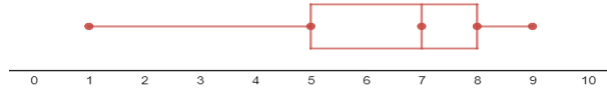


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Statistics & Probability

10. Nine employees were asked to rate their job satisfaction on a scale from 0 (very low) to 10 (high very)? Their responses are displayed in the box plot below. Which of the following data sets could be represented by this box plot?



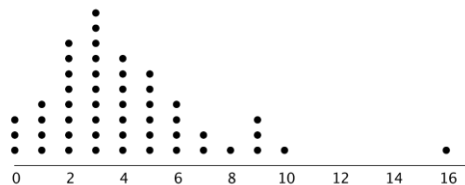
- A. {1, 2, 3, 4, 5, 6, 7, 8, 9}
- B. {2, 5, 5, 5, 7, 7, 8, 8, 9}
- C. {1, 5, 5, 6, 7, 7, 8, 8, 8}
- D. {1, 5, 5, 6, 6, 7, 8, 8, 9}
- E. {1, 5, 5, 6, 7, 7, 8, 8, 9}

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Statistics & Probability

11. Which of the following statements is **true** about the data shown in the dot plot below? (There are 50 data points.)



- A. The median and mode of the data are the same.
- B. The mode is greater than the median.
- C. The mean and the mode are the same.
- D. The mean is greater than the median.
- E. The data are negatively skewed.

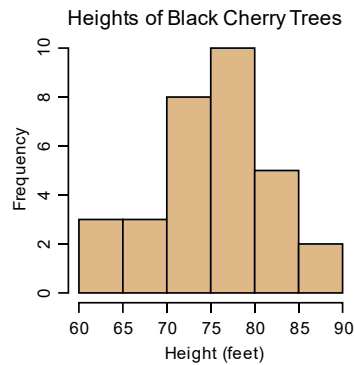
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Statistics & Probability

12. Which of the following statements **cannot** be confirmed using only the information available in the histogram below?

- A. The data are approximately normally distributed.
- B. There are 31 trees in the sample.
- C. About 16.1% of the trees in the sample are between 80-85 ft. tall.
- D. The distribution is unimodal.
- E. The median tree height is 77.5 ft.



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