Appendix B

100 Math Drills

In This Chapter:

Test your GRE Math Facts with these drills, which isolate individual skills to help you hone mastery.

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Drills

Absolute Value

1. What is the absolute value of -9?
2. What is the absolute value of 5?
3. If $b = 3$, what is the value of $|10b - 5|$?
4. If $c = -3$, what is the value of $|-6c - 9|$?
5. For which values of a, if any, does $|-6a + 52| = -10a + 76$?

Algebra: Solve for x

1. Solve for z: $z + 9 = 4z - 12$
2. Solve for y: $-5y + 8 = -2y + 32$
3. Solve for z: $-z - 1 = z - 11$
4. Solve for y: $-4y + 7 = 5y + 88$
5. Solve for y: $3y + 5 = 2y + 8$

Averages

1. What is the average (arithmetic mean) of -4, 8, 3, and -3?
2. What is the average (arithmetic mean) of 12, -19, -9, and 4?
3. If the average (arithmetic mean) of -17, -11, 20, 14, and x is 3, what is the value of x?
4. If the average (arithmetic mean) of 19, 16, and x is 12, what is the value of x?
5. If the average (arithmetic mean) of 11, 11, -10, x, and y is -2, what is the value of $x + y$?

Circles

1. If the circumference of a circle is 2π, what is the area of the circle?
2. If the radius of a circle is 10, what is the circumference of the circle?
3. A cylindrical can has a circular base with diameter 18. The volume of the can is 486π. What is the height of the can?
4. A cylindrical can has a circular base with radius 7. The height of the can is 9. What is the volume of the can?
5. Two circles both have their centers at the same point. The diameter of the smaller circle is 16 units and the diameter of the larger circle is 24 units. What is the area of the region contained inside the larger circle, but outside the smaller circle?

Combinatorics

1. In how many ways can a committee of 7 people be selected from a group of 9 people?
2. In how many different ways can 6 people be arranged in a straight line?
3. A certain school has 2 second graders and 7 first graders. In how many different ways can a team consisting of 2 second graders and 1 first grader be selected from among the students at the school?
4. The code for a particular combination lock can only include letters, symbols, and digits from a selection of 7 letters, 3 digits, and 5 symbols. A valid code for the lock must consist of exactly 2 letters, 1 symbol, 1 digit, and 1 symbol, in that order, and repetition is allowed. How many different codes are possible?
5. A certain salad bar offers a selection of 2 types of lettuce, 4 types of nuts, and 3 proteins. How many different salads can be created consisting of exactly 1 type of lettuce, exactly 4 types of nuts, and at least 2 proteins?

Coordinate Plane

1. What is the x-intercept of the line $y = -\frac{1}{2}x + 9$?
2. What is the x-intercept of the line $y = 10x - 10$?
3. A line has a slope of 8 and passes through the point $(-9,-80)$. What is the y-intercept of the line?
4. Line A has the equation $y = -7x - 7$. Line B is perpendicular to Line A and passes through the point $(-3, -2)$. What is the equation of Line B?
5. Line A has the equation $y = -9x + 4$. Line B is perpendicular to Line A and passes through the point $(5, 9)$. What is the equation of Line B?

Divisibility and Primes

1. What are the factors of 105?
2. What are the factors of 75?
3. What is the greatest common factor of 25 and 10?
4. The prime factors of x are [2, 2, 3, 5, 7]. What is the value of x?
5. What are the prime factors of 1,029?

Exponents

1. Simplify: $5^{c-3}/5^{-2}$
2. Simplify: $9^{-2a+4}/9^{-2a-1}$
3. Simplify: $6^{z+1}/6^{2z-5}$
4. Simplify: $2^{-2y+1} \times 2^{y+2}$
5. Simplify: $7^{-x-5} \times 7$

Fractions

1. $\frac{5}{9} + \frac{1}{3} = ?$
2. $\frac{5}{13} + \frac{9}{15} = ?$
3. $\frac{2}{15} + \frac{2}{8} = ?$
4. $\frac{10}{12} \times \frac{11}{15} = ?$
5. $\frac{2}{7} \div \frac{4}{7} = ?$

Median

1. A certain set consists of 7 integers: 15, 6, 4, 7, 8, 16, and x. If $x \leq 3$, what is the median of the set?
2. A certain set consists of 4 integers: 8, 8, 19, and x. If $x \leq 4$, what is the

median of the set?
3. What is the median of a set of 7 consecutive integers, if the smallest of those integers is 6?
4. A certain set contains 5 unique integers: -4, a, -9, -10, and -17. If the median of the set is -9, what is the smallest possible value of a?
5. A certain set consists of 4 consecutive integers. If the median of the set is 1.5, what is the largest integer in the set?

Odds and Evens

1. If a is odd and b is odd, is $5ab + 9b + 4$ even or odd?
2. If a is odd and b is even, is $7ab + 7a + 9b + 7$ even or odd?
3. If $3a + 6$ is odd, is a even or odd?
4. If $9a + 8$ is odd, is a even or odd?
5. If a is even, is $a + 3$ even or odd?

Order of Operations

1. Simplify: $-(4 \times (-1) - (-6 + 2))$
2. Simplify: $-(-(5 + 8))$
3. Simplify: $(3 \times (-3) + (-8 + 2)) \times (6 - 8)$
4. Simplify: $(-(-3 \times 1)) \times (-10) \times (1 + 2) \times (-(-8))$
5. Simplify: $(6 - (-10) - 3^2 + 10 - 0 + 4 \times 2)^2$

Percent Change

1. 72 is 28% less than what number?
2. 24 is 40% less than what number?
3. 166 is p% greater than 83. Solve for p.
4. 182 is p% greater than 91. Solve for p.
5. 84 is p% less than 336. Solve for p.

Percent Of

1. 18 is 12% of y. Solve for y.
2. 2 is 10% of y. Solve for y.
3. 16 is p% of 50. Solve for p.
4. x is 10% of y. y is what percent of x?
5. x is 50% of y. y is what percent of x?

Positives and Negatives

1. If $y > 0$, $z > 0$, and $xy^6z^6 > 0$, is x positive or negative?
2. If $a < 0$, $b > 0$, and $a^2b^5c^5 > 0$, is c positive or negative?
3. If $b < 0$ and $a^5b^6 > 0$, is a positive or negative?
4. If $x > 0$, $z > 0$, and $x^7y^7z^5 < 0$, is y positive or negative?
5. If $y > 0$, $z < 0$, and $x^3yz^4 < 0$, is x positive or negative?

Rates

1. If Vehicle A can complete a 72 mile trip at a rate of 36 miles per hour, at what rate would Vehicle B have to travel to complete a trip of 120 miles in the same amount of time?
2. If a vehicle travels 324 miles in 9 hours, what is its average speed in miles per hour?
3. If a vehicle traveling at 84 kilometers per hour can currently complete a certain trip in 10 hours, how long would the vehicle take to complete the same trip at a rate of 105 kilometers per hour?
4. If x identical machines can assemble 24 gadgets in 6 hours, how long will it take $3x$ such machines to assemble 84 gadgets?
5. If Machine A produces 25 widgets per day and Machine B produces 4 widgets per day, how many widgets can they produce in 5 days by working together?

Ratios

1. Simplify the following ratio: 100 : 60
2. The total number of roses and tulips in a garden is 40. If there are 28 roses in the garden, what is the ratio of roses to tulips?
3. The total number of hats and scarves in a thrift store is 28. If there are 8 hats in the thrift store, what is the ratio of hats to scarves?
4. The ratio of hippos to alligators in a river is 4 : 5. If there are 96 hippos in the river, how many alligators are in the river?
5. The ratio of cars to trucks in a parking lot is 5 : 13. If there are 36 cars and trucks in the parking lot in total, how many cars are in the parking lot?

Remainders

1. 257 objects are divided into groups that each contain 14 objects. If as many groups as possible are created, how many objects will be left over?
2. If 113 objects are divided into 8 groups of equal size, what is the smallest possible number of objects that will be left over?
3. If 39 objects are divided into 4 groups of equal size, what is the smallest possible number of objects that will be left over?
4. 109 objects are divided into groups that each contain 8 objects. If as many groups as possible are created, how many objects will be left over?
5. What is the remainder when 196 is divided by 13?

Sequences

1. $S_1 = 7$, and $S_n = S_{n-1} + 5$ for all $n \geq 1$. What is the value of S_{28}?
2. $S_1 = -9$, and $S_n = S_{n-1} - 2$ for all $n \geq 1$. What is the value of S_{27}?
3. The first term of a sequence is −48, and every term after the first is $\frac{3}{4}$ of the previous term. What is the 7th term of the sequence?
4. The first term of an sequence is 3, and every term after the first is 5 less than the previous term. What is the 93rd term of the sequence?
5. A certain sequence begins with the terms 4, −4, −1, 5, −1, 4, −4, −1, 5, −1, 4, −4, −1, 5, −1, … and continues to repeat indefinitely. What is the sum of the first 81 terms of the sequence?

Triangles

1. A right triangle has leg lengths of 20 and 40. What is the length of its hypotenuse?
2. A right triangle has a hypotenuse of length 150. If one of the two legs of the right triangle has length 90, what is the length of the other leg?
3. A right triangle has one leg of length 48. If the area of the right triangle is 1,536, what is the length of the hypotenuse?
4. A triangle has angles measuring 126, 31, and x degrees. What is the value of x?
5. A triangle has angles measuring 66, 46, and y degrees. What is the value of y?

Answers

Absolute Value Answers

1. 9
2. 5
3. 25
4. 9
5. $a = 6$

Algebra: Solve for x Answers

1. 7
2. −8
3. 5
4. −9
5. 3

Averages Answers

1. 1
2. −3
3. 9
4. 1
5. −22

Circles Answers

1. 1π
2. 20π
3. 6
4. 441π
5. 80π square units

Combinatorics Answers

1. 36
2. 720

3. 7
4. 3,675
5. 8

Coordinate Plane Answers

1. 18
2. 1
3. y = −8
4. $y = \frac{1}{7}x - \frac{11}{17}$
5. $y = \frac{1}{9}x + \frac{76}{9}$

Divisibility and Primes Answers

1. 1, 3, 5, 7, 15, 21, 35, and 105
2. 1, 3, 5, 15, 25, and 75
3. 5
4. 420
5. 3, 7, 7, and 7

Exponents Answers

1. 5^{c-1}
2. 9^{5}
3. 6^{-z+6}
4. 2^{-y+3}
5. 7^{-x-4}

Fractions Answers

1. $\frac{8}{9}$

2. $\frac{64}{65}$
3. $\frac{1}{30}$
4. $\frac{11}{18}$
5. $\frac{1}{2}$

Median Answers

1. 7
2. 8
3. 9
4. −8
5. 3

Odds and Evens Answers

1. Even
2. Even
3. Odd
4. Odd
5. Odd

Order of Operations Answers

1. 0
2. 13
3. 30
4. −720
5. 625

Percent Change Answers

1. 100
2. 40
3. 100
4. 100
5. 75

Percent Of Answers

1. 150
2. 20
3. 32
4. 1,000
5. 200

Positives and Negatives Answers

1. Positive
2. Positive
3. Positive
4. Negative
5. Negative

Rates Answers

1. 60 miles per hour
2. 36 miles per hour
3. 8 hours
4. 7 hours
5. 145

Ratios Answers

1. 5:3
2. 7:3
3. 2:5
4. 120
5. 10

Remainders Answers

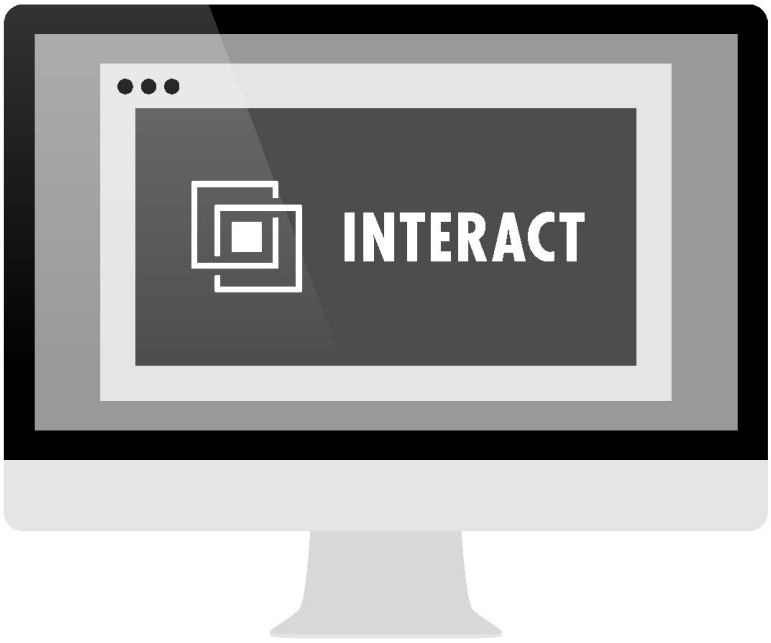
1. 5
2. 1
3. 3
4. 5
5. 1

Sequences Answers

1. 142
2. −61
3. $-\frac{2,187}{256}$
4. −457
5. 52

Triangles Answers

1. $20\sqrt{5}$
2. 120
3. 80
4. 23
5. 68



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Acknowledgments

A great number of people were involved in the creation of the book you are holding. First and foremost is Zeke Vanderhoek, the founder of Manhattan Prep. Zeke was a lone tutor in New York when he started the company in 2000. Now, nearing the end of its second decade, the company contributes to the successes of thousands of students around the globe every year.

Our Manhattan Prep Strategy Guides are based on the continuing experiences of our instructors and students. Jen Dziura was the primary author and editor of the original edition of this book, with editorial support from Chris Ryan and Emily Meredith Sledge. Questions were written not only by Jen, Chris, and Emily, but also by many other instructors, including Roman Altshuler, Chris Berman, Faruk Bursal, Dmitry Farber, Stacey Koprince, David Mahler, Seb Moosapoor, Stephanie Moyerman, Michael Schwartz, Tate Shafer, Tommy Wallach, and Ryan Wessel.

The Second Edition brought even more talent to the table. It was authored by Liz Moliski and Emily Meredith Sledge and edited by Whitney Garner, Stacey Koprince, and Stephanie Moyerman. New content was written by Liz and Emily, as well as by Roman Altshuler, Chris Berman, Brian Birdwell, Josh Braslow, Ceilidh Erickson, Rina Goldfield, Joe Lucero, Ryan Starr, Neil Thornton, and Julia Van Dyke.

The Third Edition that you are holding continues the 5 Lb. tradition in fine fashion. This edition was authored and edited by Rina Goldfield. New content was generated by Rina, as well as by Chelsey Cooley, and Patrick Tyrrell, including contributions from Kaplan colleagues.

Our colleagues at Kaplan Publishing, together with Mario Gambino, managed the production process, making sure that all the moving pieces came together at just the right time. Jay Thomas and Isaac Botier provided strategic guidance and oversight for the whole project.

Finally, we are indebted to all of the Manhattan Prep students who have given us feedback over the years. This book wouldn’t be half of what it is without your voice.