PRACTICE EXAM 3: ACCUPLACER MATH SIMULATION

SUBTEST 1 — ARITHMETIC (Questions 1–20)

1. A family of four went out to dinner and the total bill came to $96. If they split the cost evenly, how much does each person pay?

A. $21.00

B. $22.50

C. $23.00

D. $24.00

2. Which of the following fractions is greatest?

A. 3/8

B. 5/8

C. 2/5

D. 1/2

3. What is 7/12 − 1/4 in lowest terms?

A. 1/3

B. 2/3

C. 1/4

D. 5/12

4. A store buys calculators for $18 each and sells them for $27 each. What is the percent markup?

A. 33%

B. 40%

C. 50%

D. 66%

5. Estimate 789 × 41 to the nearest thousand.

A. 30,000

B. 32,000

C. 35,000

D. 40,000

6. Convert 5/8 to a decimal.

A. 0.58

B. 0.68

C. 0.5

D. 0.625

7. A man earns $52,000 per year. What is his weekly salary, assuming 52 weeks per year?

A. $1,000.00

B. $1,040.00

C. $1,100.00

D. $1,200.00

8. What is the reciprocal of 3/7?

A. 3/7

B. −3/7

C. 7/3

D. −7/3

9. A 24-ounce box of cereal costs $4.80. What is the unit price per ounce?

A. $0.15

B. $0.18

C. $0.25

D. $0.20

10. Simplify: $9 - 4 \times 2 + 6 \div 3$.

A. 2

B. 3

C. 5

D. 7

11. A family buys groceries for $87.65 and pays with a $100 bill. How much change should they receive?

A. $12.35

B. $12.55

C. $13.35

D. $13.45

12. Which of the following is less than 1/3?

A. 2/5

B. 4/9

C. 3/8

D. 1/4

13. A farmer harvested 1,248 bushels of wheat over 3 days, working equally each day. How many bushels did he harvest on average per day?

A. 406 bushels

B. 416 bushels

C. 426 bushels

D. 450 bushels

14. What is 0.04×0.5?

A. 0.02

B. 0.2

C. 0.04

D. 0.002

15. A rectangular field measures 150 feet by 90 feet. What is the total area?

A. 240 square feet

B. 13,000 square feet

C. 13,500 square feet

D. 14,000 square feet

16. Round 14,682 to the nearest thousand.

A. 15,000

B. 14,000

C. 14,700

D. 14,680

17. A bicycle wheel has a diameter of 26 inches. What is its radius?

A. 52 inches

B. 26 inches

C. 13 inches

D. 6.5 inches

18. Which whole number is closest to 7/9?

A. 0 (closer to zero)

B. 1 (closer to one)

C. 7 (closer to seven)

D. 9 (closer to nine)

19. A contractor needs 3¼ gallons of paint for one coat. How many gallons does she need for 4 coats?

A. 11 gallons

B. 11½ gallons

C. 12 gallons

D. 13 gallons

20. What is the greatest common factor of 36 and 54?

A. 18

B. 9

C. 6

D. 12

SUBTEST 2 — QUANTITATIVE REASONING, ALGEBRA, AND STATISTICS (Questions 21–40)

21. Solve for x: 4x + 9 = 2x − 7.

A. 2

B. 4

C. −8

D. −4

22. The point (3, k) lies on the line y = 2x − 5. What is k?

A. −1

B. 0

C. 5

D. 1

23. A survey of 80 students shows 45 prefer tea and the rest prefer coffee. What percent prefer coffee?

A. 40.0%

B. 43.75%

C. 50.0%

D. 56.25%

24. Simplify: $2(3x - 4) - (x + 6)$.

A. $5x - 14$

B. $7x - 10$

C. $5x - 2$

D. $6x - 10$

25. What is the probability of rolling a sum of 7 on two fair dice?

A. 1/12

B. 1/9

C. 1/8

D. 1/6

26. A line has equation $2x - 3y = 12$. What is its slope?

A. $-2/3$

B. 2

C. $2/3$

D. $-3/2$

27. The mean of five test scores is 82. If one score is 75, what is the sum of the other four?

A. 335

B. 328

C. 340

D. 350

28. If $y = 3x^2 - 2$, what is y when $x = -3$?

A. 29

B. 25

C. 23

D. 21

29. A number decreased by 20% gives 64. What is the number?

A. 76

B. 78

C. 80

D. 82

30. Solve the inequality: $4 - 3x > 10$.

A. $x < -2$

B. $x > -2$

C. $x < 2$

D. $x > 2$

31. A triangle has sides 7, 24, and 25. Is it a right triangle?

A. No, the square sums do not match

B. Yes, it satisfies $7^2 + 24^2 = 25^2$

C. No, no two sides add to the third

D. Yes, it is equilateral

32. A die is rolled once. What is the probability of rolling a number greater than 4?

A. 1/6

B. 1/4

C. 1/2

D. 1/3

33. Which equation represents a line with slope 4 passing through $(1, -2)$?

A. $y = 4x + 2$

B. $y = 4x - 2$

C. $y = 4x - 6$

D. $y = 4x + 6$

34. The interquartile range of {4, 7, 9, 12, 15, 18, 22} is:

A. 11

B. 18

C. 9

D. 13

35. Two numbers sum to 30 and differ by 6. What is the larger number?

A. 12

B. 14

C. 16

D. 18

36. If a circle has a circumference of 20π cm, what is its radius?

A. 5 cm

B. 10 cm

C. 15 cm

D. 20 cm

37. Simplify: $(x + 3)(x - 5)$.

A. $x^2 + 8x - 15$

B. $x^2 - 8x - 15$

C. $x^2 - 2x - 15$

D. $x^2 + 2x - 15$

38. A bag has 3 red, 5 blue, and 4 green marbles. What is the probability of drawing a green marble?

A. 1/3

B. 1/4

C. 5/12

D. 1/2

39. The weighted average of scores 80 (weight 2) and 92 (weight 3) is:

A. 84

B. 85.2

C. 86

D. 87.2

40. What is the y-intercept of the line $3x + 5y = 15$?

A. 5

B. 3

C. 15

D. 1

SUBTEST 3 — ADVANCED ALGEBRA AND FUNCTIONS (Questions 41–60)

41. Factor: $3x^2 - 12x$.

A. $3(x^2 - 12)$

B. $3x(x - 12)$

C. $3x(x - 4)$

D. $x(3x - 12)$

42. If $f(x) = \sqrt{(x + 5)}$, what is $f(11)$?

A. 4

B. 16

C. 6

D. 8

43. Solve: $\log_5(x) = 3$.

A. 15

B. 25

C. 100

D. 125

44. The axis of symmetry for $y = x^2 - 4x + 7$ is:

A. $x = -2$

B. $x = 2$

C. $x = 7$

D. $x = 4$

45. Simplify: $(x + 2)^2 - (x - 2)^2$.

A. 4

B. $4x$

C. $8x$

D. 16

46. Solve for x: $4^x = 1/64$.

A. 3

B. -2

C. 2

D. -3

47. If $\sin\theta = 0.6$ and θ is acute, $\cos\theta = ?$

A. 0.8

B. 0.6

C. 1.0

D. 0.4

48. Simplify: $\sqrt{(x^6y^4)}$.

A. x^3y

B. x^6y^2

C. x^3y^2

D. x^2y^2

49. The solutions to $x^2 + 2x - 8 = 0$ are:

A. $x = 2, -4$

B. $x = -4, 2$

C. $x = 4, -2$

D. $x = -2, 4$

50. What is the sum of the first 10 terms of the arithmetic sequence 4, 7, 10, 13, …?

A. 130

B. 145

C. 160

D. 175

51. The function $f(x) = -3(x - 1)^2 + 8$ has a maximum value of:

A. 8

B. 1

C. −3

D. 11

52. Which expression equals $1/(x - 2) + 1/(x + 2)$?

A. $2/(x^2 - 4)$

B. $1/(x^2 - 4)$

C. $2x/(x^2 - 4)$

D. $2/(x + 2)$

53. Simplify: $\log(100) + \log(10)$.

A. 2

B. 3

C. 4

D. 1

54. The graph of $y = 2^x$ passes through which point?

A. (0, 0)

B. (1, 1)

C. (2, 8)

D. (0, 1)

55. What is the range of $f(x) = x^2 + 3$?

A. $y \geq 3$

B. $y \geq 0$

C. all real numbers

D. $y \leq 3$

56. Simplify: $(x^2 \cdot x^{-5})^{-2}$.

A. x^{-6}

B. x^{10}

C. x^{-10}

D. x^6

57. A geometric sequence has first term 5 and common ratio 1/2. The 4th term is:

A. 2.5

B. 0.625

C. 1.25

D. 0.3125

58. In a 45-45-90 triangle, if each leg is 6, the hypotenuse is:

A. 6

B. 12

C. $6\sqrt{2}$

D. $6\sqrt{3}$

59. Solve: $|x - 4| < 3$.

A. $1 < x < 7$

B. $x < 1$ or $x > 7$

C. $x < 7$ only

D. $x > 1$ only

60. Simplify: $\log(x^3 \cdot x^2) - \log(x)$.

A. $\log(x^3)$

B. $4 \log(x)$

C. $\log(x^4)$

D. $5 \log(x)$

PRACTICE EXAM 3: ANSWER KEY AND EXPLANATIONS

Subtest 1 — Arithmetic

1. D — $24.00. Dividing the total bill by the number of people gives $96 ÷ 4 = $24.00. Equal split problems always divide the total cost by the number of participants.
2. B — 5/8. Converting to decimals gives 0.375, 0.625, 0.4, and 0.5 respectively, so 5/8 at 0.625 is the largest. Fraction comparison is most reliable when all values are converted to decimals.
3. A — 1/3. The common denominator is 12, so 7/12 − 3/12 = 4/12, which simplifies to 1/3. Fraction subtraction always requires a common denominator before combining numerators.
4. C — 50%. The markup is $27 − $18 = $9, and dividing by the original cost gives 9/18 = 0.50 = 50%. Markup percent is always calculated relative to the original cost.
5. B — 32,000. Rounding 789 to 800 and 41 to 40 gives 800 × 40 = 32,000. Estimation rounds numbers to convenient values before multiplying.
6. D — 0.625. Dividing 5 by 8 gives 0.625 exactly, making this the correct decimal form. Fraction-to-decimal conversions always use division.
7. A — $1,000.00. Dividing the annual salary by 52 weeks gives $52,000 ÷ 52 = $1,000. This is a unit rate conversion from yearly to weekly income.
8. C — 7/3. The reciprocal of a fraction flips the numerator and denominator, so 3/7 becomes 7/3. Reciprocals always preserve the sign of the original number.
9. D — $0.20. Dividing $4.80 by 24 ounces gives $0.20 per ounce. Unit price is calculated by dividing total cost by the number of units.
10. B — 3. Following order of operations, 4 × 2 = 8 and 6 ÷ 3 = 2, giving 9 − 8 + 2 = 3. Multiplication and division are performed before addition and subtraction.
11. A — $12.35. Subtracting the purchase amount from the tender gives $100.00 − $87.65 = $12.35. Change problems are straightforward subtraction.
12. D — 1/4. Converting to decimals gives 0.4, 0.444, 0.375, and 0.25, with 1/3 ≈ 0.333. Only 0.25 is less than 0.333, so 1/4 is the correct answer.
13. B — 416 bushels. Dividing total harvest by number of days gives 1,248 ÷ 3 = 416 bushels per day. Average problems divide the total by the count.

14. A — 0.02. Multiplying 0.04 × 0.5 equals 0.02, verified by counting three decimal places total in the factors. Decimal multiplication tracks the number of decimal places.

15. C — 13,500 square feet. Area of a rectangle is length × width: 150 × 90 = 13,500 ft². Area is always measured in squared units.

16. A — 15,000. The hundreds digit is 6, which is 5 or greater, so the thousands digit rounds up from 4 to 5. Rounding rules apply to the digit immediately right of the rounding place.

17. C — 13 inches. The radius is always half the diameter: 26 ÷ 2 = 13 inches. Diameter and radius differ by a factor of 2.

18. B — 1. The decimal form of 7/9 is approximately 0.778, which rounds to 1 rather than 0. Fraction-to-whole-number rounding compares the decimal to the nearest integer.

19. D — 13 gallons. Multiplying gives 3¼ × 4 = 13/4 × 4 = 13 gallons. Fraction multiplication cancels the denominator when the multiplier equals it.

20. A — 18. The factors of 36 are 1, 2, 3, 4, 6, 9, 12, 18, 36 and of 54 are 1, 2, 3, 6, 9, 18, 27, 54. The largest common factor in both lists is 18.

Subtest 2 — QAS

21. C — −8. Subtracting 2x from both sides gives 2x + 9 = −7, then subtracting 9 gives 2x = −16, so x = −8. Linear equations isolate the variable through inverse operations.

22. D — 1. Substituting x = 3 into y = 2x − 5 gives y = 6 − 5 = 1. Function evaluation replaces the variable with the given input value.

23. B — 43.75%. The number who prefer coffee is 80 − 45 = 35, and 35/80 = 0.4375 = 43.75%. Percent problems divide the part by the whole.

24. A — 5x − 14. Distributing gives 6x − 8 − x − 6, and combining like terms produces 5x − 14. Always distribute the negative sign across every term in the second expression.

25. D — 1/6. There are 6 ways to roll a sum of 7 out of 36 total outcomes (1+6, 2+5, 3+4, 4+3, 5+2, 6+1), giving 6/36 = 1/6. A sum of 7 is the most likely outcome when rolling two dice.

26. C — 2/3. Solving for y gives −3y = 12 − 2x, then y = (2/3)x − 4. The coefficient of x in slope-intercept form is the slope.

27. A — 335. The sum of five scores with mean 82 is 410, and subtracting the known score gives 410 − 75 = 335. The mean formula rearranges to sum = mean × count.

28. B — 25. Substituting x = −3 gives 3(9) − 2 = 27 − 2 = 25. Squaring the negative produces a positive result before multiplying.

29. C — 80. If the result after a 20% decrease is 64, then 64 represents 80% of the original. Dividing 64 by 0.80 gives 80.

30. A — $x < -2$. Subtracting 4 from both sides gives $-3x > 6$, then dividing by -3 flips the inequality to $x < -2$. Dividing by a negative always reverses the inequality direction.

31. B — Yes, $7^2 + 24^2 = 25^2$. Calculating gives $49 + 576 = 625 = 25^2$, confirming the Pythagorean relationship. The set 7-24-25 is one of the common Pythagorean triples.

32. D — 1/3. Numbers greater than 4 on a die are 5 and 6 — two of the six possible outcomes. The probability is $2/6 = 1/3$.

33. C — $y = 4x - 6$. Using point-slope form $y - (-2) = 4(x - 1)$, simplification gives $y + 2 = 4x - 4$, so $y = 4x - 6$. Point-slope form converts directly to slope-intercept form.

34. A — 11. Q1 is 7 (median of lower half {4, 7, 9}) and Q3 is 18 (median of upper half {15, 18, 22}). IQR = Q3 − Q1 = 18 − 7 = 11.

35. D — 18. Setting up $x + y = 30$ and $x - y = 6$, adding the equations gives $2x = 36$, so $x = 18$. The larger number is 18 and the smaller is 12.

36. B — 10 cm. The circumference formula $C = 2\pi r$ gives $20\pi = 2\pi r$, so $r = 10$ cm. Dividing both sides by 2π isolates the radius.

37. C — $x^2 - 2x - 15$. Using FOIL: $x^2 - 5x + 3x - 15 = x^2 - 2x - 15$. The middle terms combine through addition or subtraction based on signs.

38. A — 1/3. The total marbles are $3 + 5 + 4 = 12$, and 4 are green, giving $4/12 = 1/3$. Probability is the favorable count over the total count.

39. D — 87.2. The weighted average is $(80 \times 2 + 92 \times 3) / (2 + 3) = (160 + 276) / 5 = 436/5 = 87.2$. Weighted averages multiply each value by its weight before summing.

40. B — 3. Setting $x = 0$ gives $5y = 15$, so $y = 3$. The y-intercept occurs where $x = 0$.

Subtest 3 — Advanced Algebra and Functions

41. C — $3x(x - 4)$. Pulling out the greatest common factor of $3x$ from both terms gives $3x(x - 4)$. Checking by distribution returns the original $3x^2 - 12x$.

42. A — 4. Substituting gives $f(11) = \sqrt{(11 + 5)} = \sqrt{16} = 4$. Radical function evaluation requires a nonnegative radicand.

43. D — 125. The equation $\log_5(x) = 3$ converts to exponential form as $5^3 = x$, and $5^3 = 125$. Logarithms always convert by raising the base to the output.

44. B — $x = 2$. The axis of symmetry formula is $x = -b/(2a)$, giving $x = 4/2 = 2$. The axis of symmetry passes through the vertex.

45. C — 8x. Expanding gives $(x^2 + 4x + 4) - (x^2 - 4x + 4) = 8x$. The x^2 and constant terms cancel, leaving only the middle term difference.

46. D — −3. Rewriting 1/64 as 4^{-3} gives $4^x = 4^{-3}$, so $x = -3$. Negative exponents indicate reciprocals of the base raised to the positive exponent.

47. A — 0.8. Using the Pythagorean identity $\sin^2\theta + \cos^2\theta = 1$, $\cos^2\theta = 1 - 0.36 = 0.64$, so $\cos\theta = 0.8$. The positive root is taken for acute angles.

48. C — x^3y^2. Taking the square root of each factor gives $\sqrt{x^6} = x^3$ and $\sqrt{y^4} = y^2$. The result is x^3y^2 assuming positive values.

49. B — $x = -4, 2$. Factoring $x^2 + 2x - 8$ gives $(x + 4)(x - 2) = 0$, so $x = -4$ or $x = 2$ by the zero product property.

50. D — 175. The 10th term is $a_{10} = 4 + 9(3) = 31$, and the sum $S_{10} = (10/2)(4 + 31) = 5 \times 35 = 175$. The arithmetic series formula averages the first and last terms.

51. A — 8. The vertex form $a(x - h)^2 + k$ has maximum y-value k when a is negative. Here $k = 8$, so the maximum is 8.

52. C — $2x/(x^2 - 4)$. The common denominator is $(x - 2)(x + 2) = x^2 - 4$, and the numerators combine as $(x + 2) + (x - 2) = 2x$. The sum is $2x/(x^2 - 4)$.

53. B — 3. Using $\log(100) = 2$ and $\log(10) = 1$, the sum is $2 + 1 = 3$. Common logarithms of powers of 10 equal the exponent.

54. D — (0, 1). Any exponential function b^x passes through (0, 1) because $b^0 = 1$ for any nonzero base. All exponential functions share this y-intercept.

55. A — $y \geq 3$. Since $x^2 \geq 0$ for all real x, $x^2 + 3 \geq 3$. The minimum output value is 3, giving the range $y \geq 3$.

56. D — x^6. Inside the parentheses, $x^2 \cdot x^{-5} = x^{-3}$. Then $(x^{-3})^{-2} = x^6$ by multiplying exponents.

57. B — 0.625. Using $a_n = a_1 \cdot r^{n-1}$ with $a_1 = 5$, $r = 1/2$, $n = 4$: $a_4 = 5 \times (1/2)^3 = 5/8 = 0.625$.

58. C — $6\sqrt{2}$. In a 45-45-90 triangle, the hypotenuse equals a leg times $\sqrt{2}$, so $6 \times \sqrt{2} = 6\sqrt{2}$. The side ratio $1 : 1 : \sqrt{2}$ applies to every isosceles right triangle.

59. A — $1 < x < 7$. The inequality $|x - 4| < 3$ splits as $-3 < x - 4 < 3$, and adding 4 to all parts gives $1 < x < 7$. Less-than absolute value inequalities always produce a single bounded interval.

60. B — $4 \log(x)$. Simplifying $x^3 \cdot x^2 = x^5$, so $\log(x^5) - \log(x) = \log(x^5/x) = \log(x^4) = 4 \log(x)$. The power rule pulls the exponent out in front.