# PRACTICE EXAM 10: PERT MATH SIMULATION

1. A baker uses 4 cups of sugar for every 6 cups of flour. If he uses 15 cups of flour, how many cups of sugar does he need?

A. 9 cups

B. 10 cups

C. 11 cups

D. 12 cups

2. Solve: $-3x + 7 = 22$.

A. 3

B. −3

C. −5

D. 5

3. The sum of 2⅓ and 1½ is:

A. 3⅚

B. 3½

C. 3⅓

D. 4

4. What is $6^2 - 4^2$?

A. 2

B. 4

C. 16

D. 20

5. Simplify: $2(x - 3) + 5x$.

A. $7x + 3$

B. $7x - 6$

C. $7x + 6$

D. $5x - 3$

6. A rectangle's length is 15 and width is 9. What is the perimeter?

A. 48

B. 135

C. 24

D. 60

7. Solve for y: $2y + 8 = 3y - 4$.

A. 4

B. 8

C. 10

D. 12

8. The value of $(-4)(-3)(2)$ is:

A. $-24$

B. 10

C. 24

D. $-9$

9. A store reduces a $60 shirt by 15%. The sale price is:

A. $51.00

B. $45.00

C. $50.00

D. $54.00

10. Solve: $x^2 + 2x - 15 = 0$.

A. $x = -3$ or $x = 5$

B. $x = 3$ or $x = 5$

C. $x = -5$ or $x = -3$

D. $x = 3$ or $x = -5$

11. What is 8/10 expressed as a decimal?

A. 0.08

B. 0.18

C. 1.25

D. 0.8

12. The equation $y = 3x - 5$ has a y-intercept of:

A. $-5$

B. 3

C. 5

D. $-3$

13. A circle has a diameter of 14 cm. Its radius is:

A. 28 cm

B. 14 cm

C. 7 cm

D. 3.5 cm

14. Simplify: $(x^2 + 4x)/x$.

A. $x + 4x$

B. $x + 4$

C. $x^2 + 4$

D. $4x$

15. What is $2/5 + 1/3$?

A. 3/8

B. 2/15

C. 6/15

D. 11/15

16. A triangle has base 10 and height 8. Its area is:

A. 40

B. 80

C. 18

D. 60

17. Solve: $4x - 3 > 13$.

A. $x < 4$

B. $x > 10$

C. $x > 4$

D. $x < 10$

18. The mean of {10, 15, 20, 25, 30} is:

A. 15

B. 18

C. 22

D. 20

19. Factor: $x^2 - 7x + 12$.

A. $(x - 6)(x - 2)$

B. $(x - 3)(x - 4)$

C. $(x + 3)(x - 4)$

D. $(x - 12)(x + 1)$

20. The slope of a horizontal line is:

A. 0

B. undefined

C. 1

D. negative

21. A pair of shoes costs $80 plus 6% sales tax. The total cost is:

A. $82.00

B. $86.00

C. $84.80

D. $85.00

22. Simplify: $-4(2x - 1) + 3$.

A. $-8x + 3$

B. $-8x - 1$

C. $-8x + 4$

D. $-8x + 7$

23. A student correctly answered 27 out of 30 questions. What percent is this?

A. 90%

B. 85%

C. 80%

D. 75%

24. Solve: $x/5 + 2 = 7$.

A. 20

B. 25

C. 30

D. 35

25. The perimeter of a square with side length 12 is:

A. 24

B. 36

C. 144

D. 48

26. Simplify: $\sqrt{64} + \sqrt{9}$.

A. 11

B. 13

C. 15

D. 73

27. Which ordered pair satisfies $y = 2x + 3$?

A. (0, 2)

B. (1, 4)

C. (2, 7)

D. (3, 5)

28. A train travels 180 miles in 3 hours. What is its average speed?

A. 45 mph

B. 60 mph

C. 90 mph

D. 75 mph

29. Solve: $(x + 5) - 2(x - 1) = 10$.

A. $x = 2$

B. $x = 0$

C. $x = 5$

D. $x = -3$

30. A bag has 3 green, 5 red, and 2 blue marbles. The probability of drawing a red marble is:

A. 1/3

B. 2/5

C. 1/2

D. 3/10

# PRACTICE EXAM 10: ANSWER KEY AND EXPLANATIONS

1. B — 10 cups. Setting up the proportion $4/6 = x/15$ and cross-multiplying gives $6x = 60$, so $x = 10$ cups of sugar. Proportion problems scale known ratios to match new quantities through cross-multiplication.

2. C — −5. Subtracting 7 from both sides gives $-3x = 15$, then dividing by −3 gives $x = -5$. Dividing an equation by a negative does not flip an equals sign (only inequalities require flipping).

3. A — 3⅚. Converting to improper fractions gives $7/3 + 3/2$. The common denominator is 6, giving $14/6 + 9/6 = 23/6$, which converts to 3⅚ as a mixed number.

4. D — 20. Calculating each square gives $6^2 = 36$ and $4^2 = 16$, and subtracting produces $36 - 16 = 20$. Order of operations evaluates exponents before the subtraction.

5. B — $7x - 6$. Distributing the 2 gives $2x - 6$, and combining with $5x$ produces $7x - 6$. Like terms are combined only after distribution is complete.

6. A — 48. The perimeter formula $P = 2l + 2w$ gives $P = 2(15) + 2(9) = 30 + 18 = 48$. Perimeter adds the lengths of all four sides around the rectangle.

7. D — 12. Subtracting $2y$ from both sides gives $8 = y - 4$, then adding 4 gives $y = 12$. Equations with variables on both sides are solved by collecting variables on one side.

8. C — 24. Multiplying $(-4)(-3)$ gives 12, and multiplying 12 by 2 gives 24. Two negatives multiply to a positive, and the third factor preserves that positive result.

9. A — $51.00. A 15% discount means paying 85% of the original price, so $0.85 \times \$60 = \$51.00$. The shortcut method multiplies the original price by the remaining percentage.

10. D — $x = 3$ or $x = -5$. Factoring $x^2 + 2x - 15$ gives $(x + 5)(x - 3) = 0$ because two numbers that multiply to −15 and add to 2 are 5 and −3. The zero product property yields $x = -5$ or $x = 3$.

11. D — 0.8. Dividing 8 by 10 gives exactly 0.8. Fractions with a denominator of 10 convert directly to decimals by placing the numerator in the tenths place.

12. A — −5. In slope-intercept form $y = mx + b$, the y-intercept is b. For the equation $y = 3x - 5$, $b = -5$, so the y-intercept is −5.

13. C — 7 cm. The radius is always half the diameter, so $14 \div 2 = 7$ cm. Diameter and radius always differ by a factor of 2.

14. B — $x + 4$. Factoring the numerator gives $x(x + 4)$, and dividing by $x$ leaves $(x + 4)$. This simplification is valid for all $x \neq 0$, where the original expression is undefined.

15. D — 11/15. The common denominator of 5 and 3 is 15, so $2/5 = 6/15$ and $1/3 = 5/15$. Adding the numerators gives $6/15 + 5/15 = 11/15$, which is already in lowest terms.

16. A — 40. The triangle area formula is $A = \frac{1}{2}bh$, so $A = \frac{1}{2}(10)(8) = 40$. Half the product of base and height always produces triangle area.

17. C — $x > 4$. Adding 3 to both sides gives $4x > 16$, then dividing by 4 gives $x > 4$. The inequality sign does not flip because division is by a positive number.

18. D — 20. Adding the five values gives $10 + 15 + 20 + 25 + 30 = 100$, and dividing by 5 gives 20. The mean is always the sum divided by the count.

19. B — $(x - 3)(x - 4)$. Two numbers that multiply to 12 and add to $-7$ are $-3$ and $-4$. The factored form $(x - 3)(x - 4)$ expands back to $x^2 - 7x + 12$.

20. A — 0. A horizontal line has no vertical change (rise = 0), so its slope is 0/run = 0. Horizontal lines always have a slope of zero, while vertical lines have an undefined slope.

21. C — \$84.80. Sales tax of 6% on \$80 is $0.06 \times 80 = \$4.80$, and adding to the original price gives $\$80 + \$4.80 = \$84.80$. The one-step multiplier method computes $1.06 \times 80$ directly.

22. D — $-8x + 7$. Distributing $-4$ gives $-8x + 4$, and adding 3 produces $-8x + 7$. Always distribute the negative across every term inside the parentheses.

23. A — 90%. Dividing 27 by 30 gives 0.9, which converts to 90%. Percent problems always divide the part by the whole before converting to a percentage.

24. B — 25. Subtracting 2 from both sides gives $x/5 = 5$, then multiplying both sides by 5 gives $x = 25$. Equations with fractions are solved by clearing the denominator through multiplication.

25. D — 48. The perimeter of a square is 4 times the side length: $4 \times 12 = 48$. All four sides of a square are equal, so perimeter is always the side times four.

26. A — 11. Evaluating the radicals gives $\sqrt{64} = 8$ and $\sqrt{9} = 3$, and adding produces $8 + 3 = 11$. Each radical is simplified separately before combining.

27. C — (2, 7). Substituting $x = 2$ into $y = 2x + 3$ gives $y = 4 + 3 = 7$, which matches the point. A point lies on a line only when its coordinates satisfy the equation.

28. B — 60 mph. Dividing total distance by total time gives $180 \div 3 = 60$ miles per hour. Average speed is always calculated as distance divided by time.

29. D — $x = -3$. Distributing gives $x + 5 - 2x + 2 = 10$, combining like terms produces $-x + 7 = 10$. Subtracting 7 gives $-x = 3$, so $x = -3$.

30. C — 1/2. The bag contains 3 + 5 + 2 = 10 marbles, and 5 are red. The probability is 5/10 = 1/2 when reduced to simplest form.