

ACT Math Practice Test 3

50 Minutes — 45 Questions

Choose the best answer for each question. A permitted calculator may be used. Figures are not necessarily drawn to scale.

- 1) A 15-foot board is cut into pieces that are each 20 inches long. How many complete pieces can be cut from the board?

- ☐ A. 8 ☐ C. 12
☐ B. 10 ☐ D. 9

- 2) Which equation represents the relationship in the table?

x	1	2	3	4
y	9	14	19	24

- ☐ F. $y = 3x + 5$ ☐ H. $y = 5x + 4$
☐ G. $y = 4x + 5$ ☐ J. $y = 6x + 2$
- 3) For $f(x) = \log_3 x$, what is $f(81)$?
- ☐ A. 3 ☐ C. 9
☐ B. 4 ☐ D. 27
- 4) A sphere has a radius of 6 centimeters. What is the surface area of the sphere? Use $\pi \approx 3.14$.
- ☐ F. 75.36 cm^2 ☐ H. 452.16 cm^2
☐ G. 150.72 cm^2 ☐ J. 904.32 cm^2
- 5) What is the mode of the data set 2, 2, 4, 5, 5, 5, 7, 8, 8, 9?
- ☐ A. 2 ☐ C. 4
☐ B. 5 ☐ D. 8
- 6) A network of stadiums had approximately 8×10^6 visits in the fall season. This is 50% of its annual attendance. Approximately how many visits did the network have for the full year?
- ☐ F. 4×10^6 ☐ H. 1.6×10^7
☐ G. 4×10^7 ☐ J. 1.6×10^8
- 7) A bank account has \$500 invested at 4% annual interest compounded semi-annually (twice per year). How much will be in the account after 1 year?
- ☐ A. \$520.00 ☐ C. \$520.40
☐ B. \$520.20 ☐ D. \$521.00
- 8) If $5(2x - 1) = 3x + 30$, what is the value of x ?
- ☐ F. 5 ☐ H. 4
☐ G. 3 ☐ J. 7

- 9) In a right triangle, the side lengths are 6, 8, and 10. An acute angle θ is opposite the side of length 6. What is $\cos \theta$?
- ☐ A. $\frac{3}{5}$ ☐ C. $\frac{3}{4}$
☐ B. $\frac{4}{5}$ ☐ D. $\frac{4}{3}$
- 10) A café offers 3 sandwiches, 4 side dishes, and 2 drinks. If a meal consists of one sandwich, one side dish, and one drink, how many different meals can be ordered?
- ☐ F. 24 ☐ H. 9
☐ G. 12 ☐ J. 36
- 11) After a 20% discount, a jacket costs \$48. What was its price before the discount?
- ☐ A. \$60 ☐ C. \$58
☐ B. \$54 ☐ D. \$64
- 12) The product of two consecutive positive integers is 72. What is the smaller integer?
- ☐ F. 6 ☐ H. 9
☐ G. 7 ☐ J. 8
- 13) Let $f(x) = 5x - 4$. What is $f^{-1}(11)$?
- ☐ A. 2 ☐ C. 11
☐ B. 4 ☐ D. 3
- 14) The formula for the volume of a cone is $V = \frac{1}{3}\pi r^2 h$. Solve for h .
- ☐ F. $h = \frac{3V}{\pi r^2}$ ☐ H. $h = 3V\pi r^2$
☐ G. $h = \frac{V}{3\pi r^2}$ ☐ J. $h = \frac{\pi r^2}{3V}$
- 15) A line of best fit for a data set has the equation $y = -2x + 50$. What does the slope of -2 represent?
- ☐ A. For each increase of 1 in x , y decreases by 2 ☐ C. The y -value when $x = 0$ is -2
☐ B. For each increase of 1 in x , y increases by 2 ☐ D. The data has no correlation
- 16) The graph of $f(x) = x^2 - 1$ is reflected across the y -axis. What is the equation of the image?
- ☐ F. $g(x) = -x^2 - 1$ ☐ H. $g(x) = x^2 + 1$
☐ G. $g(x) = x^2 - 1$ ☐ J. $g(x) = -x^2 + 1$
- 17) A survey finds that 15 of the 24 students in band are juniors. If one band member is selected at random, what is the probability that the student is a junior?
- ☐ A. $\frac{5}{8}$ ☐ C. $\frac{1}{4}$
☐ B. $\frac{3}{8}$ ☐ D. $\frac{5}{12}$
- 18) The table shows the number of pages a student reads over time at a constant rate.

Time (minutes)	10	20	30	40
Pages Read	12	24	36	48

Which equation represents this relationship, where p is pages read and t is time in minutes?

- ☐ F. $p = 1.2t$ ☐ H. $p = 2t$
☐ G. $p = t + 2$ ☐ J. $p = 12t$

19) Which recursive formula generates the sequence $-6, -1, 4, 9, \dots$?

☐ A. $a_1 = -6, a_n = a_{n-1} - 5$

☐ C. $a_1 = -6, a_n = 5a_{n-1}$

☐ B. $a_1 = -1, a_n = a_{n-1} + 5$

☐ D. $a_1 = -6, a_n = a_{n-1} + 5$

20) For $f(x) = \frac{2x+1}{x-3}$, what value of x makes $f(x) = 3$?

☐ F. 8

☐ H. 10

☐ G. 9

☐ J. 11

21) What is the value of $(3 - 2i)(4 + i)$, where $i^2 = -1$?

☐ A. $10 - 5i$

☐ C. $14 + 5i$

☐ B. $14 - 5i$

☐ D. $10 + 5i$

22) A printer finishes a job in 4 hours, and a second printer finishes it in 6 hours. How long will they take working together?

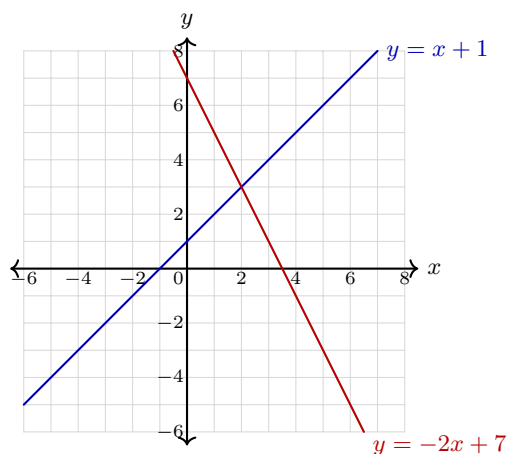
☐ F. 5 hours

☐ H. 10 hours

☐ G. 1.2 hours

☐ J. 2.4 hours

23) The graph shows the lines $y = x + 1$ and $y = -2x + 7$ on the same coordinate plane. What is the solution to the system of equations represented by these two lines?



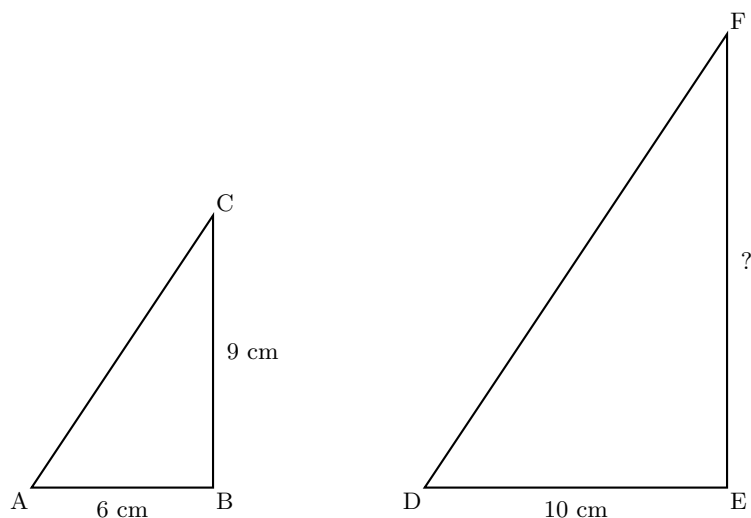
☐ A. $(0, 1)$

☐ C. $(3, 1)$

☐ B. $(1, 5)$

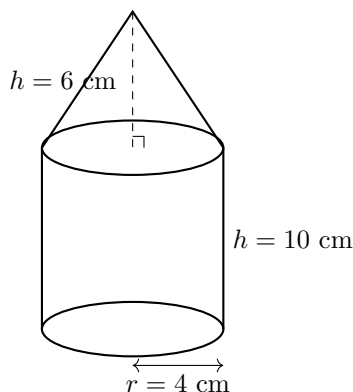
☐ D. $(2, 3)$

- 24) In the diagram, triangles ABC and DEF are similar. If $AB = 6$ centimeters, $BC = 9$ centimeters, and $DE = 10$ centimeters, what is the length of EF ?



- ☐ F. 15 cm
 ☐ H. 12 cm
☐ G. 13.5 cm
 ☐ J. 18 cm
- 25) A sports drink is mixed in a concentrate-to-water ratio of 3 : 8. How many liters of concentrate are needed to make 4.4 liters of the drink?
- ☐ A. 0.8
 ☐ C. 1.2
☐ B. 1.0
 ☐ D. 1.5
- 26) A scientist rewrites the expression $\frac{10a^{-2}b^4}{5ab^{-1}}$ using only positive exponents. Which result is correct?
- ☐ F. $2a^{-3}b^5$
☐ H. $\frac{2a^3}{b^5}$
☐ G. $\frac{2b^5}{a^3}$
☐ J. $2a^{-1}b^3$
- 27) If $3x - 2y = 11$, what is the value of $9x^2 - 12xy + 4y^2$?
- ☐ A. 100
 ☐ C. 132
☐ B. 110
 ☐ D. 121
- 28) For what value of x is $2^{x+1} = 8^{x-1}$?
- ☐ F. 1
 ☐ H. 4
☐ G. 3
 ☐ J. 2
- 29) Point $P(4, -2)$ is reflected across the y -axis and then translated 3 units right and 5 units up. What are the coordinates of the image point?
- ☐ A. $(-1, 3)$
☐ C. $(-1, 7)$
☐ B. $(1, 3)$
☐ D. $(7, 3)$
- 30) How many liters of a 60% solution should be added to 10 liters of a 30% solution to make a 40% solution?
- ☐ F. 5 liters
 ☐ H. 10 liters
☐ G. 8 liters
 ☐ J. 15 liters

- 31) A toy is made by placing a cone on top of a cylinder. The cylinder has radius 4 cm and height 10 cm. The cone has the same radius and height 6 cm. What is the total surface area of the toy (excluding the base where cone meets cylinder)? Use $\pi \approx 3.14$.



- ☐ A. 301.44 cm²
☐ C. 392.01 cm²
- ☐ B. 351.68 cm²
☐ D. 452.16 cm²
- 32) A student's homework average is 84 and counts for 20% of the course grade. The quiz average is 92 and counts for 30%. The final exam counts for the remaining 50%. What score on the final exam is needed for a course grade of 90?
- ☐ F. 90.0
☐ H. 92.4
- ☐ G. 91.2
☐ J. 94.0
- 33) What is $\frac{4.8 \times 10^{-5}}{1.2 \times 10^3}$ written in scientific notation?
- ☐ A. 4×10^{-2}
☐ C. 2.5×10^{-7}
- ☐ B. 4×10^{-8}
☐ D. 4×10^8
- 34) A container holds 40 marbles, of which 14 are red. Some blue marbles are added. Afterward, the probability of selecting a red marble is $\frac{7}{25}$. How many blue marbles were added?
- ☐ F. 5
☐ H. 10
- ☐ G. 8
☐ J. 12
- 35) A set of 8 numbers has a mean of 15. A ninth number is added, raising the mean to 16. Then one of the original 8 numbers is removed, and the mean of the remaining 8 numbers is 15.5. What number was removed?
- ☐ A. 16
☐ C. 24
- ☐ B. 20
☐ D. 28
- 36) If r and s are the solutions of $x^2 - 7x + 1 = 0$, what is the value of $r^2 + s^2$?
- ☐ F. 45
☐ H. 48
- ☐ G. 46
☐ J. 47
- 37) Let $f(x) = |x - 3| + |x + 1|$. What is the sum of all real values of x for which $f(x) = 8$?
- ☐ A. -8
☐ C. 2
- ☐ B. -2
☐ D. 8

- 38) A rectangular prism has a length of 9 units, a width of 12 units, and a volume of 648 cubic units. What is the length of a space diagonal of the prism?
- ☐ F. 15 units ☐ H. $3\sqrt{37}$ units
- ☐ G. 17 units ☐ J. $3\sqrt{29}$ units
- 39) A press prints 48 pages per minute, and 5% of the pages are rejected. How many minutes must it run to produce 10,944 acceptable pages?
- ☐ A. 216 ☐ C. 252
- ☐ B. 228 ☐ D. 240
- 40) A scale drawing of a rectangular field uses 1 centimeter to represent 250 meters. The field measures 3.2 centimeters by 4.8 centimeters on the drawing. What is the actual area of the field, in hectares? (1 hectare = 10,000 square meters.)
- ☐ F. 9.6 ☐ H. 96
- ☐ G. 48 ☐ J. 960
- 41) How many integer values of x satisfy $-4 \leq \frac{3-2x}{5} < 2$?
- ☐ A. 14 ☐ C. 16
- ☐ B. 15 ☐ D. 17
- 42) A polynomial is given by $p(x) = x^3 + ax^2 + bx + 5$. When $p(x)$ is divided by $x - 1$, the remainder is 7; when it is divided by $x - 2$, the remainder is 17. What is $p(3)$?
- ☐ F. 37 ☐ H. 41
- ☐ G. 39 ☐ J. 43
- 43) The equation $x^2 + y^2 - 6x + 4y - 12 = 0$ represents a circle. What is the area of the circle?
- ☐ A. 9π square units ☐ C. 36π square units
- ☐ B. 16π square units ☐ D. 25π square units
- 44) In a group of 120 students, 72 ride the bus to school. Of the bus riders, $\frac{5}{8}$ are in a club. Of the other students, $\frac{1}{4}$ are in a club. If a student is selected at random, what is the probability that the student is in a club?
- ☐ F. $\frac{17}{40}$ ☐ H. $\frac{1}{2}$
- ☐ G. $\frac{19}{40}$ ☐ J. $\frac{3}{5}$
- 45) A two-digit positive integer leaves a remainder of 3 when divided by 5 and a remainder of 1 when divided by 4. What is the sum of all integers with these properties?
- ☐ A. 245 ☐ C. 265
- ☐ B. 255 ☐ D. 275

Scratch work

Answer Key and Explanations

1. D Standard: ACT Math: Integrating Essential Skills

Convert the board's length to inches so both measurements use the same unit: $15(12) = 180$ inches. Divide by 20 inches per piece: $180/20 = 9$. The board makes exactly 9 complete pieces.

2. H Standard: ACT Math: Algebra

The rate of change (slope) is constant: $\frac{14-9}{2-1} = 5$ and $\frac{19-14}{3-2} = 5$. Substitute $(1, 9)$ into $y = 5x + b$: $9 = 5(1) + b$, so $b = 4$.

The equation is $y = 5x + 4$.

3. B Standard: ACT Math: Functions

The value $\log_3 81$ asks which exponent on 3 produces 81. Since $3^4 = 81$, we have $f(81) = 4$. A logarithm is another way to ask for an exponent.

4. H Standard: ACT Math: Geometry

Use the surface area formula for a sphere: $SA = 4\pi r^2$. Substitute $r = 6$ and $\pi = 3.14$: $SA = 4 \times 3.14 \times 6^2 = 4 \times 3.14 \times 36 = 452.16 \text{ cm}^2$. The surface area is 452.16 cm^2 .

5. B Standard: ACT Math: Statistics & Probability

The mode is the value that appears most often. In this list, 5 appears three times; 2 and 8 each appear twice, and the other values appear once. So the mode is 5.

6. H Standard: ACT Math: Number & Quantity

Let x be the annual total. Then $0.50x = 8 \times 10^6$, so $x = \frac{8 \times 10^6}{0.50} = 16 \times 10^6 = 1.6 \times 10^7$. The network had approximately 1.6×10^7 visits for the full year.

7. B Standard: ACT Math: Integrating Essential Skills

The stated 4% is the rate for a full year. Since interest is added twice, each six-month period earns 2%. Apply that growth twice: $500(1.02)(1.02) = 500(1.0404) = 520.20$. So after one year the account holds \$520.20.

8. F Standard: ACT Math: Algebra

Distribute the 5 first: $10x - 5 = 3x + 30$. Subtract $3x$ from both sides and add 5 to both sides to get $7x = 35$, so $x = 5$. Substitution gives $5(10 - 1) = 45$ and $15 + 30 = 45$, which checks the solution.

9. B Standard: ACT Math: Geometry

Cosine is adjacent side divided by hypotenuse. Relative to θ , the adjacent leg has length 8 and the hypotenuse has length 10, so $\cos \theta = 8/10 = 4/5$. The side opposite the angle is not used for cosine.

10. F Standard: ACT Math: Statistics & Probability

For each of the 3 sandwich choices, there are 4 side choices, and for each of those combinations there are 2 drink choices. Multiply the independent choices: $3 \times 4 \times 2 = 24$. So the café can make 24 different meals.

11. A Standard: ACT Math: Integrating Essential Skills

A 20% discount leaves 80% of the original price. If the original price is P , then $0.80P = 48$. Divide by 0.80 to get $P = 60$. The original price was \$60; checking, a 20% discount takes \$12 off and leaves \$48.

12. J Standard: ACT Math: Algebra

Let the smaller integer be n ; the next integer is $n + 1$. Their product gives $n(n + 1) = 72$, or $n^2 + n - 72 = 0$. Factoring gives $(n + 9)(n - 8) = 0$. Since the problem asks for a positive integer, $n = 8$ is the solution.

13. D Standard: ACT Math: Functions

To find $f^{-1}(11)$, look for the input that makes f equal 11. Solve $5x - 4 = 11$: adding 4 gives $5x = 15$, so $x = 3$. As a quick check, $f(3) = 15 - 4 = 11$.

14. F Standard: ACT Math: Geometry

Start with $V = \frac{1}{3}\pi r^2 h$. Multiply both sides by 3 to get $3V = \pi r^2 h$. Then divide both sides by πr^2 to isolate h : $h = \frac{3V}{\pi r^2}$.

15. A Standard: ACT Math: Statistics & Probability

In a line equation, the slope tells how much y changes when x goes up by 1. Here the slope is -2 , so y drops 2 units for every 1-unit increase in x .

16. G Standard: ACT Math: Functions

A reflection across the y -axis is represented by finding $f(-x)$. Substitute $-x$ into the function: $f(-x) = (-x)^2 - 1 = x^2 - 1$. Since the rule stays the same, this graph is symmetric about the y -axis.

17. A Standard: ACT Math: Statistics & Probability

The selection is limited to the 24 students who are in band, so those 24 form the relevant group. Of them, 15 are juniors. The probability is therefore $\frac{15}{24}$; divide numerator and denominator by 3 to get $\frac{5}{8}$.

18. F Standard: ACT Math: Integrating Essential Skills

The student reads $12/10 = 1.2$ pages per minute. At that rate, 20, 30, and 40 minutes give 24, 36, and 48 pages, matching the table. So the relationship is $p = 1.2t$.

19. D Standard: ACT Math: Functions

A recursive rule needs the starting term and the repeated change. The sequence starts at -6 , and each term increases by 5 , so the rule is $a_1 = -6$ and $a_n = a_{n-1} + 5$.

20. H Standard: ACT Math: Functions

Set the function equal to 3 : $\frac{2x+1}{x-3} = 3$. Multiply both sides by $x-3$ to get $2x+1 = 3x-9$, so $x = 10$. The denominator is then 7 , not 0 , and substituting gives $21/7 = 3$.

21. B Standard: ACT Math: Number & Quantity

Multiply each term: $(3-2i)(4+i) = 12+3i-8i-2i^2$. Since $i^2 = -1$, the last term is $+2$. Combine the real terms, $12+2 = 14$, and the imaginary terms, $3i-8i = -5i$. The product is $14-5i$.

22. J Standard: ACT Math: Integrating Essential Skills

In one hour, the printers complete $\frac{1}{4} + \frac{1}{6} = \frac{3}{12} + \frac{2}{12} = \frac{5}{12}$ of the job. If t is the time together, then $\frac{5}{12}t = 1$, so $t = \frac{12}{5} = 2.4$ hours.

23. D Standard: ACT Math: Algebra

At the intersection, the two expressions for y are equal: $x+1 = -2x+7$. Solving gives $3x = 6$, so $x = 2$. Substitute into either line to find $y = 3$. The lines intersect at $(2, 3)$.

24. F Standard: ACT Math: Geometry

For similar triangles, corresponding sides are proportional. Set up the proportion: $\frac{AB}{DE} = \frac{BC}{EF}$. Substitute known values: $\frac{6}{10} = \frac{9}{EF}$. Cross-multiply: $6 \cdot EF = 10 \cdot 9 = 90$. Solve for EF : $EF = \frac{90}{6} = 15$ cm. The length of EF is 15 cm.

25. C Standard: ACT Math: Integrating Essential Skills

The ratio has $3+8 = 11$ total parts, and 3 of those parts are concentrate. So the concentrate is $\frac{3}{11}$ of the finished drink. Multiply the total amount by that fraction: $\frac{3}{11}(4.4) = 1.2$ liters.

26. G Standard: ACT Math: Number & Quantity

First divide the coefficients: $10 \div 5 = 2$. For a , subtract exponents: $a^{-2} \div a^1 = a^{-3}$, which moves to the denominator as $\frac{1}{a^3}$. For b , subtract exponents carefully: $b^4 \div b^{-1} = b^{4-(-1)} = b^5$. So the expression becomes $2a^{-3}b^5 = \frac{2b^5}{a^3}$.

27. D Standard: ACT Math: Algebra

The expression is the square of the left side of the given equation: $(3x-2y)^2 = 9x^2 - 12xy + 4y^2$. Since $3x-2y = 11$, the requested value is $11^2 = 121$. There is no need to find x and y separately.

28. J Standard: ACT Math: Functions

Rewrite 8 as 2^3 so both sides have base 2 : $2^{x+1} = 2^{3x-3}$. Since the bases are equal and greater than 1 , their exponents must match. Thus $x+1 = 3x-3$, which gives $4 = 2x$ and $x = 2$. Substitution gives $2^3 = 8^1$, confirming the answer.

29. A Standard: ACT Math: Geometry

A reflection across the y -axis changes the sign of the x -coordinate, so $P(4, -2)$ becomes $(-4, -2)$. Moving that point 3 units right adds 3 to x , and moving it 5 units up adds 5 to y . The final point is $(-4+3, -2+5) = (-1, 3)$.

30. F Standard: ACT Math: Algebra

Let x be the liters of 60% solution added. The amount of pure solution is modeled by $0.60x + 0.30(10) = 0.40(x+10)$. This gives $0.60x + 3 = 0.40x + 4$, so $0.20x = 1$ and $x = 5$. Add 5 liters of the 60% solution.

31. C Standard: ACT Math: Geometry

Cylinder bottom area: $\pi r^2 = 3.14 \times 16 = 50.24$ cm². Cylinder lateral area: $2\pi rh = 2 \times 3.14 \times 4 \times 10 = 251.2$ cm². For the cone, slant height: $\ell = \sqrt{r^2 + h^2} = \sqrt{16 + 36} = \sqrt{52} \approx 7.211$ cm, so cone lateral area: $\pi r \ell \approx 3.14 \times 4 \times 7.211 \approx 90.57$ cm². Total surface area: $50.24 + 251.2 + 90.57 \approx 392.01$ cm². The total surface area is approximately 392.01 cm².

32. G Standard: ACT Math: Integrating Essential Skills

Let x be the final exam score. The weighted grade is $0.20(84) + 0.30(92) + 0.50x = 90$. The first two parts contribute $16.8 + 27.6 = 44.4$ points, leaving 45.6 points to come from the final. Thus $0.50x = 45.6$, so $x = 91.2$.

33. B Standard: ACT Math: Number & Quantity

Divide the coefficients and subtract the exponents: $\frac{4.8}{1.2} = 4$ and $10^{-5}/10^3 = 10^{-5-3} = 10^{-8}$. The result is 4×10^{-8} , which is already in scientific notation because 4 is between 1 and 10 .

34. H Standard: ACT Math: Statistics & Probability

The number of red marbles stays at 14 , while the total becomes $40+x$ if x blue marbles are added. Set the new probability equal to the stated value: $14/(40+x) = 7/25$. Cross-multiplying gives $350 = 280 + 7x$, so $x = 10$.

35. B Standard: ACT Math: Statistics & Probability

The original eight numbers total $8(15) = 120$. After the ninth number is added, all nine total $9(16) = 144$. Removing one original number leaves eight numbers with total $8(15.5) = 124$. The number removed is the difference between the two totals, $144 - 124 = 20$.

36. J Standard: ACT Math: Algebra

Factoring by its roots would give $(x-r)(x-s) = x^2 - (r+s)x + rs$. Comparing that with $x^2 - 7x + 1$ shows $r+s = 7$ and $rs = 1$. Now expand $(r+s)^2 = r^2 + 2rs + s^2$ and rearrange: $r^2 + s^2 = (r+s)^2 - 2rs = 7^2 - 2(1) = 47$. This avoids finding either root individually.

37. C Standard: ACT Math: Functions

The expressions inside the absolute values change sign at $x = -1$ and $x = 3$, so check the three intervals they create. Between -1 and 3 , the two distances add to 4 , so there are no solutions there. For $x < -1$, $f(x) = 2 - 2x$; setting this equal to 8 gives $x = -3$. For $x > 3$, $f(x) = 2x - 2$, which gives $x = 5$. Their sum is $-3 + 5 = 2$.

38. J Standard: ACT Math: Geometry

First use the volume to find the height: $9(12)h = 648$, so $h = 6$ units. The space diagonal connects opposite corners of the prism. Applying the Pythagorean theorem in three dimensions gives $d^2 = 9^2 + 12^2 + 6^2 = 81 + 144 + 36 = 261$. Since $261 = 9(29)$, the diagonal is $d = 3\sqrt{29}$ units.

39. D Standard: ACT Math: Integrating Essential Skills

Since 5% are rejected, 95% of the printed pages are acceptable. Let N be the number printed; then $0.95N = 10,944$, so $N = 11,520$. At 48 pages per minute, the press must run for $11,520/48 = 240$ minutes.

40. H Standard: ACT Math: Integrating Essential Skills

Use the scale on each side: 3.2 centimeters represents $3.2(250) = 800$ meters, and 4.8 centimeters represents $4.8(250) = 1,200$ meters. The actual area is $800(1,200) = 960,000$ square meters. Since each hectare is $10,000$ square meters, divide by $10,000$ to get 96 hectares.

41. B Standard: ACT Math: Algebra

Multiply all three parts by 5 to get $-20 \leq 3 - 2x < 10$. Subtract 3 : $-23 \leq -2x < 7$. Dividing by -2 reverses both inequality signs, giving $11.5 \geq x > -3.5$, or $-3.5 < x \leq 11.5$. The integers run from -3 through 11 , which is $11 - (-3) + 1 = 15$ values.

42. H Standard: ACT Math: Functions

By the Remainder Theorem, $p(1) = 7$ and $p(2) = 17$. Substituting 1 gives $a + b = 1$; substituting 2 gives $2a + b = 2$. Subtracting these equations gives $a = 1$, and then $b = 0$. Therefore $p(3) = 3^3 + 1(3^2) + 0(3) + 5 = 41$.

43. D Standard: ACT Math: Geometry

Group the x -terms and y -terms, then complete each square: $x^2 - 6x + y^2 + 4y = 12$ becomes $(x - 3)^2 + (y + 2)^2 = 12 + 9 + 4 = 25$. This is a circle with radius 5 . Its area is $\pi(5^2) = 25\pi$ square units.

44. G Standard: ACT Math: Statistics & Probability

First count club members in each group. Among the 72 bus riders, $\frac{5}{8}(72) = 45$ are in a club. The remaining $120 - 72 = 48$ students include $\frac{1}{4}(48) = 12$ club members. That makes 57 club members out of 120 students, so the probability is $\frac{57}{120} = \frac{19}{40}$.

45. C Standard: ACT Math: Number & Quantity

Numbers that leave remainder 3 when divided by 5 include $13, 18, 23, 28$, and so on. Of these, 13 leaves remainder 1 when divided by 4 ; the next number meeting both conditions comes 20 later, since 20 is divisible by both 5 and 4 . The two-digit values are $13, 33, 53, 73$, and 93 . Their sum is $5(13 + 93)/2 = 265$.