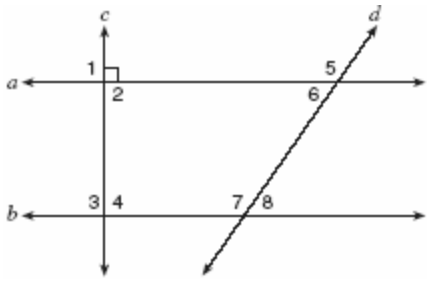
1. 010501a, P.I. G.G.25
Stan was trying to guess Melanie's age. She told him her age was an even number and a multiple of three. What could be Melanie's age?

[A] 12 [B] 10 [C] 16 [D] 15

2. 010502a, P.I. 8.G.4
In the accompanying diagram, lines *a* and *b* are parallel, and lines *c* and *d* are transversals.



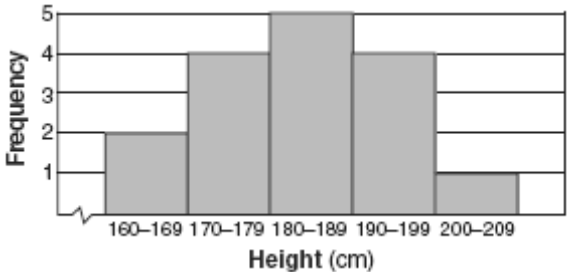
Which angle is congruent to angle 8?

[A] 4 [B] 5 [C] 6 [D] 3

3. 010503a, P.I. A.N.7
A deli has five types of meat, two types of cheese, and three types of bread. How many different sandwiches, consisting of one type of meat, one type of cheese, and one type of bread, does the deli serve?

[A] 10 [B] 30 [C] 75 [D] 25

4. 010504a, P.I. A.S.9
The accompanying histogram shows the heights of the students in Kyra's health class.



What is the total number of students in the class?

[A] 15 [B] 5 [C] 209 [D] 16

5. 010505a, P.I. G.G.45
The perimeter of $\Delta A'B'C'$, the image of ΔABC, is twice as large as the perimeter of ΔABC. What type of transformation has taken place?

[A] translation [B] dilation

[C] reflection [D] rotation

6. 010506a, P.I. A.A.1
If $n + 4$ represents an odd integer, the next larger odd integer is represented by

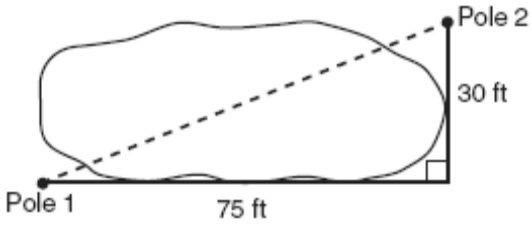
[A] $n + 5$ [B] $n + 2$

[C] $n + 6$ [D] $n + 3$

7. 010507a, P.I. A.A.22
What is the solution set of the equation $\frac{x}{5}+\frac{x}{2}=14$?

[A] {20} [B] {4} [C] {10} [D] {49}

8. 010508a, P.I. A.A.45
The NuFone Communications Company must run a telephone line between two poles at opposite ends of a lake, as shown in the accompanying diagram. The length and width of the lake are 75 feet and 30 feet, respectively.



What is the distance between the two poles, to the *nearest foot*?

[A] 81 [B] 105 [C] 69 [D] 45

9. 010509a, P.I. G.G.61
The image of point (3,-5) under the translation that shifts (x,y) to $(x-1, y-3)$ is

[A] (2,8) [B] (-3,15)

[C] (2,-8) [D] (-4,8)

10. 010510a
Which letter has point symmetry, but *not* line symmetry?

[A] T [B] X [C] H [D] S

11. 010511a, P.I. A2.A.9
Which expression is equivalent to x^{-4}?

[A] $-4x$ [B] x^4 [C] 0 [D] $\frac{1}{x^4}$

12. 010512a, P.I. 7.N.3
If $x^3 < x < \frac{1}{x}$, then x could be equal to

[A] $\frac{1}{5}$ [B] 5 [C] 1 [D] $\frac{6}{5}$

13. 010513a, P.I. G.G.26
Which statement is logically equivalent to the statement "If you are an elephant, then you do not forget"?

[A] If you forget, then you are not an elephant.

[B] If you are an elephant, then you forget.

[C] If you do not forget, then you are not an elephant.

[D] If you do not forget, then you are an elephant.

14. 010514a, P.I. G.G.36
What is the sum, in degrees, of the measures of the interior angles of a pentagon?

[A] 360 [B] 540 [C] 180 [D] 900

15. 010515a, P.I. A2.S.11
How many different three-member teams can be selected from a group of seven students?

[A] 5,040 [B] 210 [C] 35 [D] 1

16. 010516a, P.I. A.N.1
What is the multiplicative inverse of $\frac{3}{4}$?

[A] -1 [B] $-\frac{3}{4}$ [C] $-\frac{4}{3}$ [D] $\frac{4}{3}$

17. 010517a, P.I. A.A.23
Sean knows the length of the base, *b*, and the area, *A*, of a triangular window in his bedroom. Which formula could he use to find the height, *h*, of this window?

[A] $h = \frac{A}{2b}$ [B] $h = 2A - b$

[C] $h = \frac{2A}{b}$ [D] $h = (2A)(b)$

18. 010518a, P.I. A.N.6
The expression $-|-7|$ is equivalent to

[A] 1 [B] -7 [C] 0 [D] 7

19. 010519a, P.I. A.RP.11
In Ms. Wright's English class, 16 students are in band, 7 students play sports, 3 students participate in both activities, and 9 students are not in band and do not play sports. How many students are in Ms. Wright's English class?

[A] 26 [B] 29 [C] 7 [D] 10

20. 010520a, P.I. A.A.27
What is the solution set for the equation $x^2 - 5x + 6 = 0$?

[A] {-2,-3} [B] {2,3}

[C] {6,-1} [D] {-6,1}

21. 010521a, P.I. G.G.42
If the midpoints of the sides of a triangle are connected, the area of the triangle formed is what part of the area of the original triangle?

[A] $\frac{1}{2}$ [B] $\frac{1}{3}$ [C] $\frac{3}{8}$ [D] $\frac{1}{4}$

22. 010522a, P.I. A.A.38
Which equation represents a line that is parallel to the line whose equation is $2x + 3y = 12$?

[A] $6y - 4x = 2$ [B] $4x - 6y = 2$

[C] $6x + 4y = -2$ [D] $6y + 4x = 2$

23. 010523a, P.I. A.A.13
When $3x^2 - 8x$ is subtracted from $2x^2 + 3x$, the difference is

[A] $-x^2 + 11x$ [B] $-x^2 - 5x$

[C] $x^2 - 5x$ [D] $-x^2 - 11x$

24. 010524a, P.I. G.G.67
The coordinates of point *R* are (-3,2) and the coordinates of point *T* are (4,1). What is the length of $\overline{RT}$?

[A] $5\sqrt{2}$ [B] $2\sqrt{2}$

[C] $4\sqrt{3}$ [D] $\sqrt{10}$

25. 010525a, P.I. A.S.23
A student council has seven officers, of which five are girls and two are boys. If two officers are chosen at random to attend a meeting with the principal, what is the probability that the first officer chosen is a girl and the second is a boy?

[A] $\frac{7}{13}$ [B] $\frac{7}{14}$ [C] $\frac{2}{7}$ [D] $\frac{10}{42}$

26. 010526a, P.I. 7.N.3
Which expression has the *smallest* value?

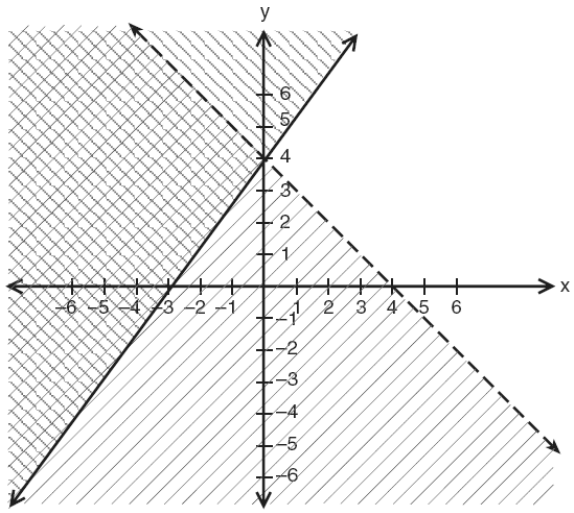
[A] $-\pi$ [B] $-\sqrt{10}$

[C] -3.02 [D] $-\frac{16}{5}$

27. 010527a, P.I. G.G.22
How many points are equidistant from two parallel lines and also equidistant from two points on one of the lines?

[A] 1 [B] 3 [C] 4 [D] 2

28. 010528a, P.I. A.A.40
Which point is in the solution set of the system of inequalities shown in the accompanying graph?



[A] (-4, 1) [B] (2, 4)
[C] (0, 4) [D] (4, -1)

29. 010529a, P.I. A.A.12
Expressed in its simplest form, $(3x^3)(2y)^2(4x^4)$ is equivalent to

[A] $48x^7y^2$ [B] $24x^{12}y^2$
[C] $48x^{12}y^2$ [D] $24x^7y^2$

30. 010530a, P.I. A.N.2
When $\sqrt{72}$ is expressed in simplest $a\sqrt{b}$ form, what is the value of *a*?

[A] 3 [B] 6 [C] 8 [D] 2

31. 010531a, P.I. A.A.44
In the accompanying diagram, a ladder leaning against a building makes an angle of $58°$ with level ground. If the distance from the foot of the ladder to the building is 6 feet, find, to the *nearest foot*, how far up the building the ladder will reach.

32. 010532a, P.I. G.G.58
Fran's favorite photograph has a length of 6 inches and a width of 4 inches. She wants to have it made into a poster with dimensions that are similar to those of the photograph. She determined that the poster should have a length of 24 inches. How many inches wide will the poster be?

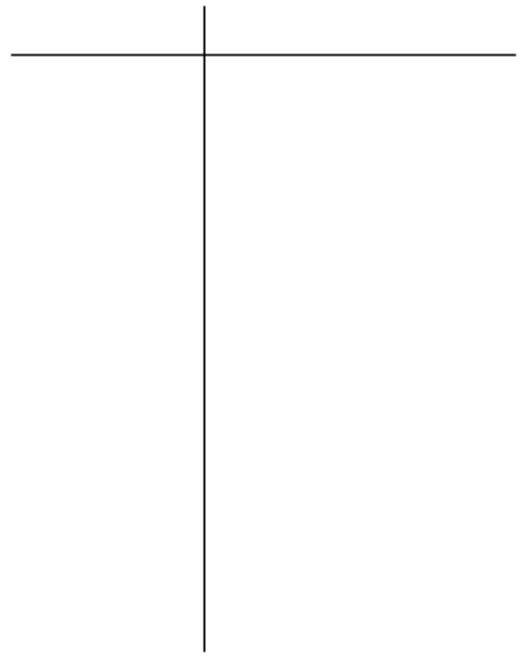
33. 010533a, P.I. G.G.39
In rectangle *ABCD*, $AC = 3x + 15$ and $BD = 4x - 5$. Find the length of $\overline{AC}$.

34. 010534a, P.I. G.G.33
José wants to build a triangular pen for his pet rabbit. He has three lengths of boards already cut that measure 7 feet, 8 feet, and 16 feet. Explain why José cannot construct a pen in the shape of a triangle with sides of 7 feet, 8 feet, and 16 feet.

35. 010535a

Construct a stem-and-leaf plot listing the scores below in order from lowest to highest.

15, 25, 28, 32, 39, 40, 43, 26, 50, 75, 65, 19, 55, 72, 50

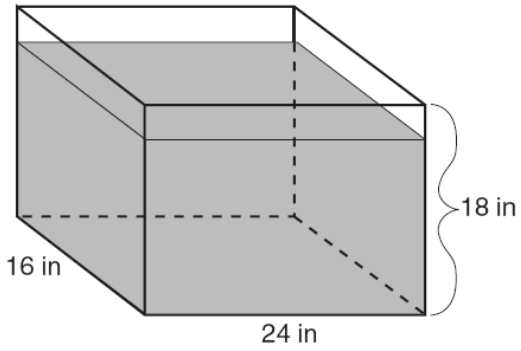


36. 010536a, P.I. A.A.21

Find all negative odd integers that satisfy the following inequality: $-3x+1\leq 17$

37. 010537a

As shown in the accompanying diagram, the length, width, and height of Richard's fish tank are 24 inches, 16 inches, and 18 inches, respectively. Richard is filling his fish tank with water from a hose at the rate of 500 cubic inches per minute. How long will it take, to the *nearest minute*, to fill the tank to a depth of 15 inches?



(Not drawn to scale)

38. 010538a, P.I. G.G.30

In ΔABC, the measure of $\angle B$ is 21 less than four times the measure of $\angle A$, and the measure of $\angle C$ is 1 more than five times the measure of $\angle A$. Find the measure, in degrees, of *each* angle of ΔABC.

39. 010539a, P.I. A.A.7

The tickets for a dance recital cost $5.00 for adults and $2.00 for children. If the total number of tickets sold was 295 and the total amount collected was $1,220, how many adult tickets were sold? [Only an algebraic solution can receive full credit.]

[1] A

[2] C

[3] B

[4] D

[5] B

[6] C

[7] A

[8] A

[9] C

[10] D

[11] D

[12] A

[13] A

[14] B

[15] C

[16] D

[17] C

[18] B

[19] B

[20] B

[21] D

[22] D

[23] A

[24] A

[25] D

[26] D

[27] A

[28] A

[29] A

[30] B

[31]
[2] 10, and appropriate work is shown.
[1] Appropriate work is shown, but one computational or rounding error is made.
or [1] Appropriate work is shown, but one conceptual error is made, such as using an incorrect trigonometric function.
or [1] Appropriate work is shown, but the length of the ladder is found.
or [1] 10, but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[32]
[2] 16, and appropriate work is shown, such as $\frac{6}{4}=\frac{24}{x}$ or a labeled diagram.
[1] Appropriate work is shown, but one computational error is made.
or [1] Appropriate work is shown, but one conceptual error is made.
or [1] An incorrect proportion is written, but it is solved appropriately.
or [1] 16, but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[2] 75, and appropriate work is shown, such as $3x+15=4x-5$.
[1] Appropriate work is shown, but one computational error is made.
or [1] Appropriate work is shown, but one conceptual error is made, such as showing $\overline{AC}$ and $\overline{BD}$ as congruent opposite sides.
or [1] A correct equation is written, but no further correct work is shown.
or [1] A correct equation is written and solved for x, but the length of $\overline{AC}$ is not found.
or [1] An incorrect equation of equal difficulty, such as $3x+15+4x-5=180$, is solved appropriately, and an appropriate length of $\overline{AC}$ is found.
or [1] 75, but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[33]

[2] The statements 7 + 8 = 15 and "15 is not greater than 16" are written or the explanation is given that the sum of any two sides of a triangle must be greater than the third side.
[1] An explanation is written that includes a reference to the triangle inequality, but the explanation is not complete or an incorrect conclusion is stated.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[34]

[2] A correct stem-and-leaf plot is drawn, including a key.
[1] The data are arranged correctly, but incorrect labels are written on the stem-and-leaf columns. [Columns do not need to be labeled for a full-credit response, but full credit may not be awarded if the columns are labeled incorrectly.]
or [1] The data are listed in the stem-and-leaf plot, but not in ascending order.
or [1] One or two of the scores are left out of the stem-and-leaf plot.
or [1] Duplicate values are left out of the stem-and-leaf plot.
[0] Incorrect labels are written on the stem-and-leaf columns, and scores are left out of the plot.
or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[35]

[36]

[3] -5, -3, -1, and appropriate work is shown, such as solving the inequality or trial and error with at least three trials and appropriate checks.
[2] Appropriate work is shown, but one computational error is made.
or [2] Appropriate work is shown, and the inequality $x \geq -5\frac{1}{3}$ is written, but no further correct work is shown.
or [2] The trial-and-error method is used to find the correct solutions, but only two trials and appropriate checks are shown.
[1] Appropriate work is shown, but two or more computational errors are made.
or [1] Appropriate work is shown, but one conceptual error is made.
or [1] The trial-and-error method is attempted and at least six systematic trials and appropriate checks are shown, but the solutions are not found.
or [1] -5, -3, -1, but no work or only one trial with an appropriate check is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[37]

[3] 12, and appropriate work is shown, such as calculating volume = 5,760 in^3 and dividing by 500 in^3.
[2] Appropriate work is shown, but one computational or rounding error is made.
or [2] The volume is found incorrectly by multiplying $24 \times 16 \times 18$, but it is divided by 500 and rounded appropriately, resulting in an answer of 14.
[1] Appropriate work is shown, but two or more computational or rounding errors are made.
or [1] Appropriate work is shown, but one conceptual error is made.
or [1] The volume of 5,760 is found correctly, but no further correct work is shown.
or [1] 12, but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[38]

[4] $m\angle A = 20$, $m\angle B = 59$, *and* $m\angle C = 101$, and appropriate work is shown.
[3] Appropriate work is shown, but one computational error is made.
or [3] A correct equation is written and solved, and the correct measures for the angles are found, but they are not labeled or are labeled incorrectly.
[2] Appropriate work is shown, but two or more computational errors are made.
or [2] Appropriate work is shown, but one conceptual error is made.
or [2] A correct equation is written and solved for x, but the measures of the angles are not found.
or [2] An incorrect equation of equal difficulty is solved appropriately, and the three angles are found.
[1] Appropriate work is shown, but one conceptual error and one computational error are made.
or [1] A correct equation is written, but no further correct work is shown.
or [1] $m\angle A = 20$, $m\angle B = 59$, *and* $m\angle C = 101$., but no work is shown.
[0] $m\angle A = 20$ *or* $m\angle B = 59$ *or* $m\angle C = 101$, but no work is shown.
or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[39]

[4] 210, and appropriate work is shown, such as a system of equations or the linear equation $5x + 2(295 - x) = 1{,}220$.
[3] Appropriate work is shown, but one computational error is made.
or [3] Appropriate work is shown, but the number of children's tickets is found as the answer.
[2] Appropriate work is shown, but two or more computational errors are made.
or [2] Appropriate work is shown, but one conceptual error is made.
or [2] An incorrect equation of equal difficulty is solved appropriately.
or [2] 210, but a method other than an algebraic solution is used.
[1] Appropriate work is shown, but one conceptual error and one computational error are made.
or [1] The correct system of equations or linear equation is written, but no further correct work is shown.
or [1] 210, but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.