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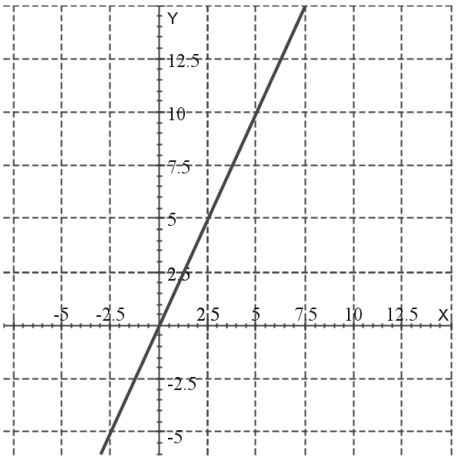
1. What is the equation of the graph?



Choose the answer from the following:

a. $x = 2$

b. $y = 2x$

c. $y = 2$

d. $y = \frac{x}{2}$

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2. A replica of the Declaration of Independence is to be mounted on cardboard, as shown in the illustration. If the border around the document has a uniform width of x inches, the total area of the display is given by

$$\left(24x^2 + 26x + 6\right) \text{ in}^2$$

Factor this expression to find the expressions that represent its length and width.Then determine the length of the document.

a. $8x - 2$
b. $4x - 2$
c. $4x + 2$
d. $8x + 2$
e. $6x + 2$
f. $6x - 2$

3. Evaluate the expression $\sqrt{b^2 - 4a}$ if $a = 43.75$, and $b = 16$. Do the operations within the radical first, and then simplify the radical. Select the correct answer.

a. 11
b. 81
c. 10
d. 9

4. The largest ocean in the world is the Pacific Ocean, which covers approximately 6.4×10^7 square miles. Express this number in standard notation.

a. 64000000 miles
b. 640000000 miles
c. 6400000 miles

5. Build up the whole number 8 to an equivalent fraction having the denominator 6.

Select the correct answer.

a. $\frac{56}{6}$
b. $\frac{24}{6}$
c. $\frac{48}{6}$
d. $\frac{64}{6}$

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6. Use the associative property of addition to complete the statement:

$$-87 + (-4 + 255)$$

Select the correct answer.

a. $[\ -87 + (-4)\ ] + 255$
b. $[\ -87 - (-4)\ ] - 255$
c. $[\ 87 - (-4)\ ] + 255$
d. $[\ 87 + (-4)\ ] - 255$

7. Write the quotient as the quotient of two radicals and simplify: $-\sqrt{\frac{160}{49}}$.

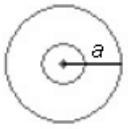
a. $-\frac{4\sqrt{10}}{7}$

b. $-\frac{4\sqrt{10}}{8}$

c. $-\frac{4\sqrt{11}}{7}$

d. $-\frac{5\sqrt{10}}{7}$

8. To the nearest tenth, find the circumference and the area of the target.



$a = 4$ in.

Select the correct answer.

a. 12.6 in., 50.3 in.^{2}
b. 12.6 in., 100.5 in.^{2}
c. 25.1 in., 50.3 in.^{2}
d. 25.1 in., 100.5 in.^{2}

9. Find the product. $\left(6t^5z^6\right)\left(2t^2z^2\right)$

a. $12t^7z^8$
b. $12t^{10}z^{12}$
c. $8t^7z^8$
d. $12t^3z^4$

10. What is the correct classification of the following polynomial?

$$10s^2 - 2$$

Select the correct answer.

a. monomial
b. binomial
c. trinomial

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11. Write 6000000 in scientific notation.

Select the correct answer.

a. 6×10^{6}
b. 6×10^{7}
c. 6×10^{5}

12. Find the pairs that satisfy the equation $y = x^3 + 4$.

a. $(-6, -212)$
b. $(0, -4)$
c. $(-9, -725)$
d. $(2, -8)$
e. $(-4, -60)$
f. $(5, 121)$

13. Write the fraction in lowest terms. If the fraction is already in lowest terms, so indicate.

$$\frac{11}{17}$$

Select the correct answer.

a. $\frac{1}{4}$
b. $\frac{1}{17}$
c. in lowest terms
d. $\frac{1}{5}$

14. Solve the inequality.

$$2x - 1.7 \leq 2.7$$

Select the correct answer.

a. $(-\infty, 0.5]$
b. $[2.2, \infty)$
c. $(-\infty, 2.2]$
d. $[0.5, \infty)$

15. One angstrom is 1×10^{-7} millimeter. Express this number in standard notation.

a. 0.000001 millimeter
b. 0.00000001 millimeter
c. 0.0000001 millimeter

16. Factor the polynomials:

$$z^2 - 16z + 64$$

a. $(z + 8)^2$
b. $(z - 8)(z + 8)$
c. $(z - 8)^2$

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17. Find the sum:

$$-2.67 + (-3.974)$$

Select the correct answer.

a. 6.644
b. −1.304
c. 1.304
d. −6.644

18. Equal amounts are invested in each of three accounts paying 7%, 8%, and 10.5% annually. The one year's combined interest income is $1249.50. How much is invested in each account?

Select the correct answer.

a. $4900
b. $3800
c. $6000
d. $7700

19. Do the operation

$$-0.4(-8)$$

Select the correct answer.

a. 3.2
b. 0.4
c. − 3.2
d. 8

20. Complete the following property.

Select the correct answer.

If $z = s$ and c is any number, then $z + c =$ _____.

a. s + c
b. s − c
c. z
d. s
e. s − z

21. What numbers are a distance of 12 away from 8 on the number line?

Select the correct answer.

a. 20, − 4
b. 5, − 3
c. 5, − 20
d. 20, 4

22. Consider the equation $y = -2x + 4$.
How many solutions does this equation have?

a. none of these choices
b. one solutions
c. infinitely many solutions
d. no solutions

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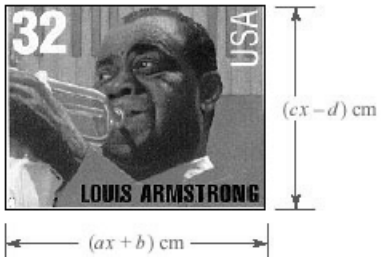
23. Find the area of the stamp shown in the figure below.
$a = 3$, $b = 5$, $c = 9$, $d = 6$



a. $27x^2 + 27x - 30$
b. $27x^2 - 27x - 30$
c. $12x^2 + 27x - 11$
d. $27x^2 + 27x + 30$
e. $12x + 27$

24. Find the product. $(t + 4)(t + 4)$

a. $t^2 + 8t + 16$
b. $t^2 + 16$
c. $t^2 - 8t + 16$
d. $t^2 - 16$

25. Do the operation

$$0(-12)$$

Select the correct answer.

a. -12
b. 1
c. 12
d. 0

26. On the Scholastic Aptitude Test, or SAT, a high school senior scored 550 on the mathematics portion and 700 on the verbal portion. What percent of the maximum 1600 points did this student receive?

Draw a diagram to help organize the facts of the problem.

Select the correct answer.

a. 75.985%
b. 78.125%
c. 88.245%
d. 69.715%

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27. Factor the trinomial:

$$6t^4 - 150t^2 + 864$$

a. $6(t - 4)(3 - t)(t + 4)(t + 3)$
b. $6(t - 4)(t - 4)(t + 3)(t + 3)$
c. $6(t - 3)(t - 3)(t + 4)(t + 4)$
d. $6(4 - t)(t - 3)(t + 4)(t + 3)$
e. $6(t - 4)(t - 3)(t + 4)(t + 3)$

28. Factor the trinomial:

$$-6u^2 + 54u - 84$$

Factor out any common monomials first (including –1 if necessary).

a. $-6(u + 2)(u - 7)$
b. $-6(u - 2)(u - 7)$
c. $-6(u - 2)(u + 7)$

29. Write the expression in simpler form.

$$-(-15)$$

Select the correct answer.

a. 15
b. 16
c. – 15
d. – 13

30. Use the distributive property to remove parentheses.

Select the correct answer.

$$a(a + 3)$$

a. $a + 3a$
b. $a^2 + 3a$
c. $a + a + 3a$
d. $a^2 + 3$

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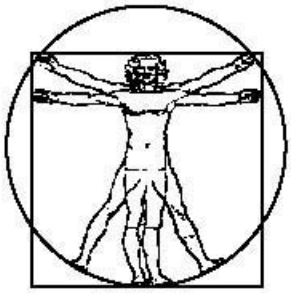
31. Leonardo daVinci's drawing relating a human figure to a square and a circle is shown in the following illustration. Find the area of the square if the man's height is $5a$ feet. Simplify.



Select the correct answer.

a. $25a^2$
b. $5a^2$
c. $5a$

32. One month before a stock car race, the sale of ads for the official race program was slow. Only 12 pages, or just 60% of the available pages, had been sold. What was the total number of pages devoted to advertising in the program?

Draw a diagram to help organize the facts of the problem.

Select the correct answer.

a. 14
b. 40
c. 20
d. 15

33. Factor the trinomial:

$$-28ty^2 - 23ty + 15t$$

a. $t(3 - 7y)(4y - 5)$
b. $t(7y - 3)(4y + 5)$
c. $t(7y - 3)(5y + 4)$
d. $t(7y - 3)(4y - 5)$
e. $t(3 - 7y)(5y + 4)$
f. $t(3 - 7y)(4y + 5)$

34. Complete factorization:

$y^2 - 10y + 24 = (y - ?)(? - 4)$.

a. $(y - 6)(y - 4)$
b. $(y + 6)(y - 4)$
c. $(y - 10)(y - 4)$
d. $(y - 6)(24y - 4)$
e. $(y - 10)(y + 4)$

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35. If a house is purchased for $100000 and is expected to appreciate $700 per year, find a polynomial function that will give the value y of the house in x years.

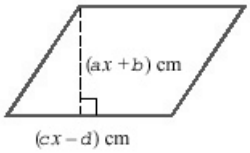
a. $y = 700x + 90000$
b. $y = 700x + 100000$
c. none of these
d. $y = 1400x + 100000$
e. $y = 1050x + 100000$
f. $y = 700x + 110000$

36. The seawater Orthlieb Pool in Casablanca, Morocco is the largest swimming pool in the world. With a perimeter of 1066 meters, this rectangular–shaped pool has a length that is 29 meters more than 6 times its width. Find its dimensions.

Select the correct answer.

a. 71 meters and 455 meters
b. 73 meters and 467 meters
c. 75 meters and 479 meters
d. 72 meters and 461 meters

37. Find the area of the figure below. $a = 10$, $b = 6$, $c = 10$, $d = 4$.



a. $100x^2 + 20x - 24$
b. $20x + 2$
c. $100x^2 - 2x - 24$
d. $20x^2 + 2x - 10$
e. $100x^2 + 2x + 24$

38. Solve the equation:

$$7x^2 - 4x = 0$$

a. $x = \frac{4}{7}, x = 0$
b. $x = \frac{7}{4}, x = 0$
c. $x = 4, x = -7$
d. $x = \frac{4}{7}, x = \frac{7}{4}$

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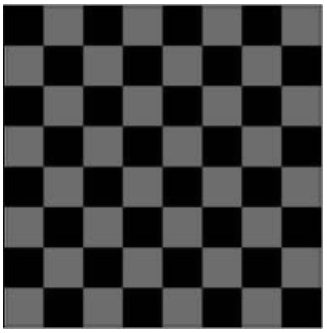
39. If the perimeter in inches of the checkerboard, shown in the illustration is $68m^2 - 72m + 40$, what is the length of one side?



a. $17m^2 - 18m + 10$
b. $18m^2 - 20m + 10$
c. $18m^2 - 18m + 11$
d. $17m^2 - 19m + 10$
e. $18m^2 - 19m + 11$
f. $18m^2 - 18m + 10$

40. Solve the formula for the given variable.

$4y - 20 = h$ for y

Select the correct answer.

a. $y = -\frac{h}{5} + 4$
b. $y = -\frac{h}{4} - 5$
c. $y = \frac{h}{5} - 4$
d. $y = \frac{h}{4} + 5$

41. Simplify the following expression. $\frac{-4z^5}{2z^5}$

Select the correct answer.

a. 2
b. $\frac{-2}{z}$
c. -2
d. $-2z^{10}$

42. Factor out -1 from the polynomial $-10x + 4y$.

a. $(-1)(10x + 4y)$
b. $(-1)(10x - 4y)$

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43. Given $z^2 - 17z + 72$, what is the coefficient of the middle term? Write the answer as the sum of two numbers whose product equals the last term.

a. $-17 = -8 - 9$
b. $17 = 7 + 10$
c. $-17 = -7 - 10$
d. $17 = 8 + 9$

44. Factor the polynomial:

$$5x^3 - 40$$

a. $5(x - 2)(x^2 + 2x + 4)$
b. $(5x - 2)(x^2 + 2x + 4)$
c. $5(x - 2)(x^2 - 2x + 4)$

45. A 9–foot pipe has been cut into two sections, one 2 times as long as the other. How long is each section?

Select the correct answer.

a. 2 ft and 7 ft
b. 4 ft and 5 ft
c. 3 ft and 6 ft
d. 1 ft and 8 ft

46. 0.18 is 15% of what number?

Select the correct answer.

a. 1.3
b. 0.9
c. 1.2
d. 1

47. How many solutions does the following quadratic equation have?

$$6a^2 + 4a = 4$$

a. two solutions
b. one solution
c. no solutions

48. Find the square root using a calculator and round the result to the nearest thousandth: $-\sqrt{0.2368}$.

a. –0.497
b. 0.623
c. –0.488
d. 0.488
e. –0.587
f. –0.487

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49. Complete the table of values.

Input	Output
x	$\frac{x}{5} + \frac{x}{3}$
15	?
– 45	?

Select the correct answer.

a.

Input	Output
x	$\frac{x}{5} + \frac{x}{3}$
15	6
– 45	– 24

b.

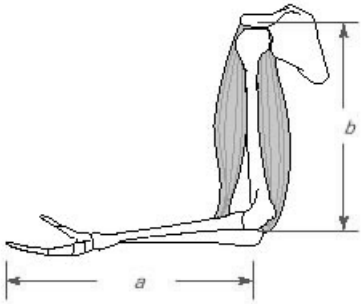
Input	Output
x	$\frac{x}{5} + \frac{x}{3}$
15	– 8
– 45	24

c.

Input	Output
x	$\frac{x}{5} + \frac{x}{3}$
15	8
– 45	– 24

50. ANATOMY

Use the measurements in the illustration to determine the length of the patient's arm if he lets it fall to his side, if $a = 5\sqrt{108}$ and $b = 6\sqrt{48}$.



Select the correct answer:

a. $56\sqrt{3}$

b. $54\sqrt{3}$

c. $108\sqrt{3}$

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51. Identify the coefficient of the term.

Select the correct answer.

$$-3x^8$$

a. x
b. -3
c. $-x$
d. 8

52. Factor the trinomial:

$$6m^2 + 5m - 6$$

a. $(2m - 3)(3m - 2)$
b. $(3 - 2m)(3m + 2)$
c. $(2m - 3)(3m + 2)$
d. $(2m + 3)(3m + 2)$
e. $(2m + 3)(3m - 2)$
f. $(2m + 3)(2 - 3m)$

53. What numbers must appear in place of A, B and C, in order to make the following solution correct?

$$7n^2 + 14n - 560 = A(n^2 + 2n - 80) = 7(n - B)(n + C).$$

a. $A = 7, B = -8, C = 10$
b. $A = 8, B = 10, C = 8$
c. $A = 7, B = 8, C = 10$

54. Write the expression without using a multiplication symbol.

$$3 \cdot a \cdot w$$

Select the correct answer.

a. $3aw$
b. $3ag$
c. aw
d. $3a$
e. $3 + a + w$

55. Evaluate the expression for the given values of the variables.

$$a^2 + 2ab + b^2 \text{ for } a = -5 \text{ and } b = -8.$$

Select the correct answer.

a. 25
b. 89
c. 64
d. 169

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56. For the finale of a musical, 45 dancers are to assemble in a triangular–shaped series of rows, where each successive row has one more dancer than the previous row. The illustration shows the beginning of such a formation. The relationship between the number of rows r and the number of dancers d is given by

$d = \frac{1}{2} r(r+1)$

Determine the number of rows in the formation.

a. 9
b. 7
c. 10

57. Simplify the radical: $\sqrt{a^7}$. Select the correct answer.

a. $a\sqrt{a}$

b. $a^4\sqrt{a}$

c. $a^6\sqrt{a}$

d. $a\sqrt{a^2}$

58. Write the equation in quadratic form:

$5a^2 + 8a = 3$

a. $5a^2 + 8a - 3 = 0$
b. $5a^2 = -8a + 3$
c. $5a^2 + 8a = 3$

59. Use the distributive property to remove parentheses.

Select the correct answer.

$-10(a - 2)$

a. $-10a - 12$
b. $-10a - 20$
c. $-10a + 20$
d. $-10a + 2$

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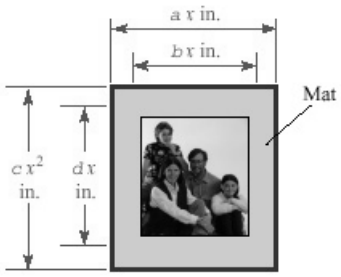
60. The dimensions of a family portrait and the frame in which it is mounted are given in the illustration below, where $a = 6$, $b = 5$, $c = 20$, $d = 20$. Write an algebraic expression that describes the area of the portrait.



a. $25x^2$

b. $20x^2(6x - 5)$

c. $100x^2$

d. $120x^3$

ANSWER KEY

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1. b
2. c
3. d
4. a
5. c
6. a
7. a
8. c
9. a
10. b
11. a
12. a,c,e
13. c
14. c
15. c
16. c
17. d
18. a
19. a
20. a
21. a
22. c
23. a
24. a
25. d
26. b
27. e
28. b
29. a
30. b
31. a
32. c
33. f
34. a
35. b
36. d
37. a
38. a
39. a
40. d
41. c
42. b
43. a
44. a
45. c
46. c
47. a
48. f
49. c
50. b
51. b
52. e
53. c
54. a
55. d
56. a
57. a
58. a
59. c
60. b