MAT 0020 / MAT 0024

Final Review

A. Acosta

---

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

$$\frac{11}{37}$$

Select the correct answer.

a. $\frac{1}{3}$
b. in lowest terms
c. $\frac{1}{5}$
d. $\frac{1}{37}$

2. Write the quotient as the quotient of two radicals and simplify: $-\sqrt{\frac{160}{25}}$.

a. $-\frac{4\sqrt{11}}{5}$
b. $-\frac{5\sqrt{10}}{5}$
c. $-\frac{4\sqrt{10}}{5}$
d. $-\frac{4\sqrt{10}}{6}$

3. Identify the coefficient of the term.

Select the correct answer.

$$-4.2\,t^2$$

a. t
b. 2
c. $-t$
d. -4.2

4. 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. 88.245%
b. 80.265%
c. 78.125%
d. 86.535%

MAT 0020 / MAT 0024

Final Review

A. Acosta

---

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

Select the correct answer.

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

6. Equal amounts are invested in each of three accounts paying 6%, 7%, and 9.5% annually. The one year's combined interest income is $1080.00. How much is invested in each account?

Select the correct answer.

a. $5200
b. $4900
c. $5900
d. $4800

7. Solve the formula for the given variable.

$2x - 8 = k$ for x

Select the correct answer.

a. $x = \frac{k}{2} + 4$
b. $x = \frac{k}{4} - 2$
c. $x = -\frac{k}{4} + 2$
d. $x = -\frac{k}{2} - 4$

8. Given $x^2 - 9x + 8$, what is the coefficient of the middle term? Write the answer as the sum of two numbers whose product equals the last term.

a. –9 = – 6 – 3
b. –9 = – 8 – 1
c. 9 = 8 + 1
d. 9 = 6 + 3

9. Find the sum:

$$-6.429 + (-1.509)$$

Select the correct answer.

a. 4.92
b. –7.938
c. 7.938
d. –4.92

10. Find the product. $\left(4y^6z^6\right)\left(3y^4z^3\right)$

a. $12y^{10}z^9$
b. $7y^{10}z^9$
c. $12y^{24}z^{18}$
d. $12y^2z^3$

MAT 0020 / MAT 0024

Final Review

A. Acosta

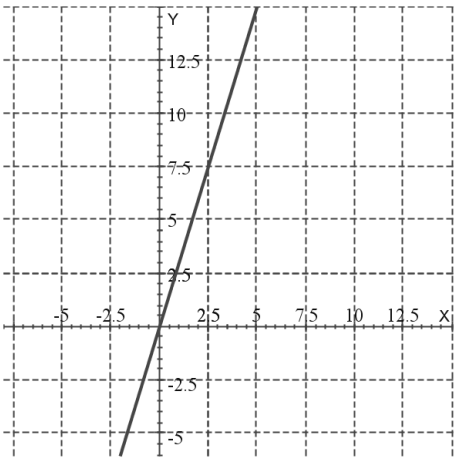
---

11. Factor the polynomial:

$$3y^3 - 24$$

a. $3(y - 2)(y^2 + 2y + 4)$
b. $(3y - 2)(y^2 + 2y + 4)$
c. $3(y - 2)(y^2 - 2y + 4)$

12. What is the equation of the graph?



Choose the answer from the following:

a. $y = \frac{x}{3}$

b. $x = 3$

c. $y = 3$

d. $y = 3x$

MAT 0020 / MAT 0024

Final Review

A. Acosta

---

13. Complete the table of values.

Input	Output
x	$\frac{x}{2} + \frac{x}{3}$
6	?
– 12	?

Select the correct answer.

a.

Input	Output
x	$\frac{x}{2} + \frac{x}{3}$
6	3
– 12	– 9

b.

Input	Output
x	$\frac{x}{2} + \frac{x}{3}$
6	– 5
– 12	10

c.

Input	Output
x	$\frac{x}{2} + \frac{x}{3}$
6	5
– 12	– 10

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

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

$$4s^2 - 9$$

Select the correct answer.

a. binomial
b. monomial
c. trinomial

MAT 0020 / MAT 0024

Final Review

A. Acosta

---

16. Factor the trinomial:

$$8z^2 + 6z - 9$$

a. $(2z - 3)(4z + 3)$
b. $(3 - 2z)(4z + 3)$
c. $(2z - 3)(4z - 3)$
d. $(2z + 3)(3 - 4z)$
e. $(2z + 3)(4z + 3)$
f. $(2z + 3)(4z - 3)$

17. Write the expression without using a multiplication symbol.

$$15 \cdot d \cdot w$$

Select the correct answer.

a. $15dg$
b. $15d$
c. $15dw$
d. dw
e. $15 + d + w$

18. Factor the polynomials:

$$x^2 - 16x + 64$$

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

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

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

20. The largest ocean in the world is the Pacific Ocean, which covers approximately 6.38×10^7 square miles. Express this number in standard notation.

a. 63800000 miles
b. 6380000 miles
c. 638000000 miles

21. Write the equation in quadratic form:

$$7a^2 + 3a = 1$$

a. $7a^2 + 3a = 1$
b. $7a^2 = -3a + 1$
c. $7a^2 + 3a - 1 = 0$

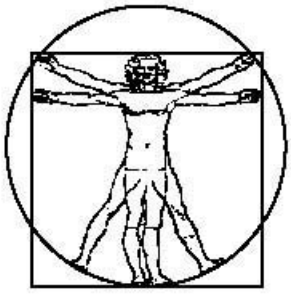
MAT 0020 / MAT 0024

Final Review

A. Acosta

---

22. 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 $7a$ feet. Simplify.



Select the correct answer.

a. $7a^2$
b. $7a$
c. $49a^2$

23. Solve the inequality.

$$2x - 4.5 \leq 6.1$$

Select the correct answer.

a. $[5.3, \infty)$
b. $[0.8, \infty)$
c. $(-\infty, 0.8]$
d. $(-\infty, 5.3]$

24. Write the expression in simpler form.

$$-(-3)$$

Select the correct answer.

a. -3
b. 2
c. -5
d. 3

25. Find the square root using a calculator and round the result to the nearest thousandth: $-\sqrt{0.4158}$.

a. −0.645
b. 0.646
c. −0.646
d. −0.655
e. 0.465
f. −0.745

MAT 0020 / MAT 0024

Final Review

A. Acosta

---

26. Complete factorization:

$a^2 - 8a + 15 = (a - ?)(? - 3)$.

a. $(a - 5)(15a - 3)$
b. $(a + 5)(a - 3)$
c. $(a - 8)(a - 3)$
d. $(a - 8)(a + 3)$
e. $(a - 5)(a - 3)$

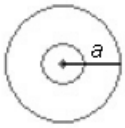
27. Consider the equation $y = -7x + 7$.
How many solutions does this equation have?

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

28. Find the pairs that satisfy the equation $y = x^3 + 5$.

a. $(-5, -120)$
b. $(0, -5)$
c. $(8, 507)$
d. $(3, -27)$
e. $(-4, -59)$
f. $(-10, -995)$

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



$a = 3$ in.

Select the correct answer.

a. 9.4 in., 28.3 $in.^2$
b. 18.8 in., 28.3 $in.^2$
c. 9.4 in., 56.5 $in.^2$
d. 18.8 in., 56.5 $in.^2$

MAT 0020 / MAT 0024

Final Review

A. Acosta

---

30. 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

$$\left(30x^2 + 32x + 8\right) \text{ in}^2$$

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

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

31. Write 300000 in scientific notation.

Select the correct answer.

a. 3×10^4
b. 3×10^5
c. 3×10^6

32. Find the product. $(s + 2)(s + 2)$

a. $s^2 - 4s + 4$
b. $s^2 - 4$
c. $s^2 + 4s + 4$
d. $s^2 + 4$

MAT 0020 / MAT 0024

Final Review

A. Acosta

---

33. Factor the trinomial:

$$-6v^2 + 60v - 144$$

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

a. $-6(v + 4)(v - 6)$
b. $-6(v - 4)(v - 6)$
c. $-6(v - 4)(v + 6)$

34. Factor out -1 from the polynomial $-8t + 3a$.

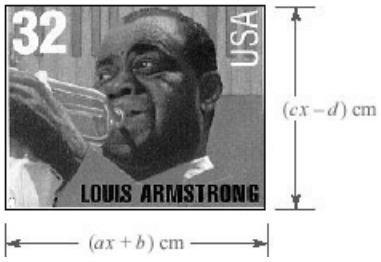
a. $(-1)(8t + 3a)$
b. $(-1)(8t - 3a)$

35. Factor the trinomial:

$$-28ay^2 - 13ay + 6a$$

a. $a(2 - 7y)(4y - 3)$
b. $a(7y - 2)(4y - 3)$
c. $a(2 - 7y)(3y + 4)$
d. $a(7y - 2)(4y + 3)$
e. $a(2 - 7y)(4y + 3)$
f. $a(7y - 2)(3y + 4)$

36. Find the area of the stamp shown in the figure below.
$a = 2$, $b = 10$, $c = 8$, $d = 7$



a. $16x^2 + 66x - 70$
b. $10x^2 + 66x - 17$
c. $10x + 66$
d. $16x^2 + 66x + 70$
e. $16x^2 - 66x - 70$

37. The seawater Orthlieb Pool in Casablanca, Morocco is the largest swimming pool in the world. With a perimeter of 1138 meters, this rectangular–shaped pool has a length that is 30 meters more than 6 times its width. Find its dimensions.

Select the correct answer.

a. 72 meters and 462 meters
b. 75 meters and 480 meters
c. 73 meters and 468 meters
d. 77 meters and 492 meters

MAT 0020 / MAT 0024

Final Review

A. Acosta

---

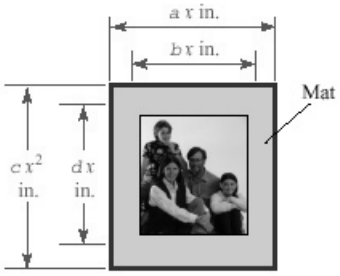
38. Use the distributive property to remove parentheses.

Select the correct answer.

$$d\,(\,d + 7\,)$$

a. $d + 7d$
b. $d + d + 7d$
c. $d^2 + 7$
d. $d^2 + 7d$

39. The dimensions of a family portrait and the frame in which it is mounted are given in the illustration below, where $a = 15$, $b = 5$, $c = 20$, $d = 20$. Write an algebraic expression that describes the area of the portrait.



a. $20\,x^2\,(\,15\,x\,-\,5\,)$
b. $100\,x^2$
c. $300\,x^3$
d. $25\,x^2$

40. Evaluate the expression $\sqrt{b^2 - 4\,a}$ if $a = 60$, and $b = 16$. Do the operations within the radical first, and then simplify the radical. Select the correct answer.

a. 4
b. 16
c. 6
d. 5

41. If a house is purchased for $130000 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. none of these
b. $y = 700\,x + 120000$
c. $y = 1050\,x + 130000$
d. $y = 700\,x + 130000$
e. $y = 700\,x + 140000$
f. $y = 1400\,x + 130000$

MAT 0020 / MAT 0024

Final Review

A. Acosta

---

42. Solve the equation:

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

a. $x = 2,\ x = -7$
b. $x = \frac{7}{2},\ x = 0$
c. $x = \frac{2}{7},\ x = \frac{7}{2}$
d. $x = \frac{2}{7},\ x = 0$

43. A 15–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. 6 ft and 9 ft
b. 5 ft and 10 ft
c. 4 ft and 11 ft
d. 3 ft and 12 ft

44. For the finale of a musical, 21 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. 6
b. 7
c. 4

45. Use the distributive property to remove parentheses.

Select the correct answer.

$$-3(b - 3)$$

a. $-3b + 3$
b. $-3b + 9$
c. $-3b - 9$
d. $-3b - 6$

MAT 0020 / MAT 0024

Final Review

A. Acosta

---

46. Simplify the radical: $\sqrt{z^7}$. Select the correct answer.

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

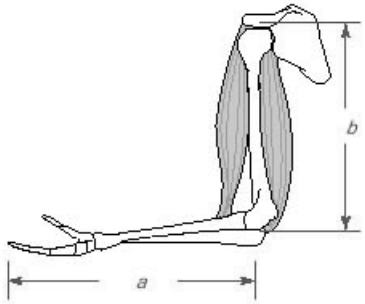
b. $z^3\sqrt{z}$

c. $z^3\sqrt{z^2}$

d. $z^4\sqrt{z}$

47. 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 $a = 5\sqrt{567}$ and $b = 4\sqrt{700}$.



Select the correct answer:

a. $85\sqrt{7}$

b. $86\sqrt{7}$

c. $170\sqrt{7}$

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

$$-74 + (-4 + 246)$$

Select the correct answer.

a. $[\,-74 - (-4)\,] - 246$
b. $[\,-74 + (-4)\,] + 246$
c. $[\,74 + (-4)\,] - 246$
d. $[\,74 - (-4)\,] + 246$

49. Simplify the following expression. $\dfrac{-8b^3}{2b^3}$

Select the correct answer.

a. 4

b. $\dfrac{-4}{b}$

c. $-4b^6$

d. -4

MAT 0020 / MAT 0024

Final Review

A. Acosta

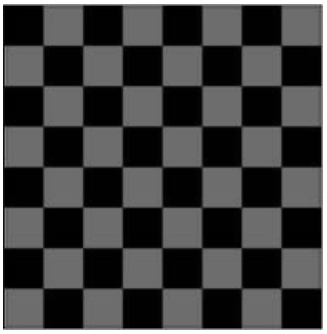
---

50. Build up the whole number 10 to an equivalent fraction having the denominator 3.

Select the correct answer.

a. $\frac{50}{3}$
b. $\frac{30}{3}$
c. $\frac{20}{3}$
d. $\frac{60}{3}$

51. If the perimeter in inches of the checkerboard, shown in the illustration is $40a^2 + 52a - 28$, what is the length of one side?



a. $10a^2 + 13a - 7$
b. $11a^2 + 14a - 8$
c. $11a^2 + 13a - 7$
d. $11a^2 + 13a - 8$
e. $10a^2 + 14a - 7$
f. $11a^2 + 15a - 7$

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

$$4a^2 + 9a = 6$$

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

53. Complete the following property.

Select the correct answer.

If $y = s$ and a is any number, then $y + a =$ _____.

a. s + a
b. y
c. s – y
d. s – a
e. s

MAT 0020 / MAT 0024

Final Review

A. Acosta

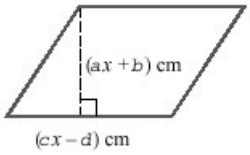
---

54. Factor the trinomial:

$$3x^4 - 39x^2 + 108$$

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

55. Find the area of the figure below. $a = 8$, $b = 10$, $c = 4$, $d = 8$.



a. $32x^2 - 2x - 80$
b. $12x^2 + 2x - 18$
c. $12x + 2$
d. $32x^2 + 2x + 80$
e. $32x^2 + -24x - 80$

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

$$7x^2 + 14x - 441 = A(x^2 + 2x - 63) = 7(x - B)(x + C).$$

a. $A = 8$, $B = 9$, $C = 7$
b. $A = 7$, $B = -7$, $C = 9$
c. $A = 7$, $B = 7$, $C = 9$

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

$$a^2 + 2ab + b^2 \text{ for } a = -3 \text{ and } b = -8.$$

Select the correct answer.

a. 64
b. 121
c. 9
d. 73

58. 0.135 is 15% of what number?

Select the correct answer.

a. 0.7
b. 0.9
c. 1.2
d. 0.8

MAT 0020 / MAT 0024

Final Review

A. Acosta

---

59. Do the operation

$$-0.5(-7)$$

Select the correct answer.

a. 0.5
b. 7
c. – 3.5
d. 3.5

60. Do the operation

$$0(-18)$$

Select the correct answer.

a. 18
b. 0
c. 1
d. – 18

ANSWER KEY

MAT 0020 / MAT 0024

Final Review

A. Acosta

---

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