مراجعة القسم الالكتروني وفق الهيكل الوزاري منهج ريفيل

موقع المناهج ⟵ المناهج الإماراتية ⟵ الصف الحادي عشر المتقدم ⟵ رياضيات ⟵ الفصل الأول ⟵ اختبارات الكترونية ⟵ الملف
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المزيد من مادة رياضيات:	ملفات اكتب للمعلم اكتب للطالب اختبارات الكترونية اختبارات احلول اعروض بوربوينت اأوراق عمل منهج انجليزي املخصات وتقارير امذكرات وبنوك االامتحان النهائي ا للمدرس

التواصل الاجتماعي بحسب الصف الحادي عشر المتقدم

صفحة المناهج الإماراتية على فيسبوك				
المواد على تلغرام	التربية الاسلامية	اللغة العربية	اللغة الانجليزية	الرياضيات

المزيد من الملفات بحسب الصف الحادي عشر المتقدم والمادة رياضيات في الفصل الأول

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Example 5

Determine whether each function represents *exponential growth* or *exponential decay*.

17. $f(x) = 7^x$

18. $g(x) = 0.99^x$

19. $h(x) = \left(\frac{2}{3}\right)^x$

20. $j(x) = \left(\frac{5}{4}\right)^x$

21. $k(x) = 0.75^x$

22. $m(x) = 1.02^x$

Example 6

Graph each function. Find the domain, range, *y*-intercept, asymptote, and end behavior.

23. $f(x) = 0.25^x$

24. $f(x) = 0.8^x$

25. $f(x) = \left(\frac{1}{2}\right)^x$

26. $f(x) = \left(\frac{2}{3}\right)^x$

Example 1

Write each equation in exponential form.

1. $\log_{15} 225 = 2$

2. $\log_3 \frac{1}{27} = -3$

3. $\log_5 \frac{1}{25} = 2$

4. $\log_3 243 = 5$

5. $\log_4 64 = 3$

6. $\log_4 32 = \frac{5}{2}$

Example 2

Write each equation in logarithmic form.

7. $2^7 = 128$

8. $3^{-4} = \frac{1}{81}$

9. $7^{-2} = \frac{1}{49}$

10. $\left(\frac{1}{7}\right)^3 = \frac{1}{343}$

11. $2^9 = 512$

12. $64^{\frac{2}{3}} = 16$

Example 2

Solve each equation.

7. $\log_4 (2x^2 - 4) = \log_4 2x$ **8.** $\log_5 (x^2 - 6) = \log_5 x$ **9.** $\log_3 (x^2 - 8) = \log_3 2x$

10. $\log_4 (2x^2 - 20) = \log_4 6x$ **11.** $\log_2 (6x^2 + 1) = \log_2 5x$ **12.** $\log_6 (6x^2 - 3) = \log_6 7x$

Examples 3 and 4

Use $\log_4 2 = 0.5$, $\log_4 3 \approx 0.7925$, and $\log_4 5 \approx 1.1610$ to approximate the value of each expression.

13. $\log_4 30$ **14.** $\log_4 20$ **15.** $\log_4 \frac{2}{3}$

16. $\log_4 \frac{4}{3}$ **17.** $\log_4 9$ **18.** $\log_4 8$

Example 5

Use $\log_2 3 \approx 1.5850$ and $\log_2 5 \approx 2.3219$ to approximate the value of each expression.

19. $\log_2 25$ **20.** $\log_2 27$ **21.** $\log_2 125$

22. $\log_2 625$ **23.** $\log_2 81$ **24.** $\log_2 243$

Solve each equation. Check your solution.

27. $\log_3 56 - \log_3 n = \log_3 7$

28. $\log_2 (4x) + \log_2 5 = \log_2 40$

29. $5 \log_2 x = \log_2 32$

30. $\log_{10} a + \log_{10} (a + 21) = \log_{10} 100$

31. $\log_2 x + \log_2 (x + 2) = \log_2 8$

32. $\log_4 (x^2 + 2x + 1) = \log_4 (11 - x)$

33. $\log_3 \frac{x^2}{4} = \log_3 25$

34. $\log_3 3d = \log_3 9$

35. $\log_{10} (3x^2 - 5x) = \log_{10} 2$

36. $\log_4 (2x^2 - 3x) = \log_4 2$

Use $\log_5 3 \approx 0.6826$ and $\log_5 4 \approx 0.8614$ to approximate the value of each expression.

37. $\log_5 40$

38. $\log_5 30$

39. $\log_5 \frac{3}{4}$

40. $\log_5 \frac{4}{3}$

41. $\log_5 9$

42. $\log_5 16$

Example 3

Solve each equation. Round to the nearest ten-thousandth.

9. $4^{5k} = 37$

10. $8^p = 50$

11. $7^y = 15$

12. $5^{4x-2} = 120$

13. $6^{x+2} = 18$

14. $2.4^{x+4} = 30$

Example 4

Solve each inequality. Round to the nearest ten-thousandth.

15. $7^{3x-1} \geq 21$

16. $6.5^{2x} \geq 200$
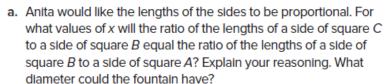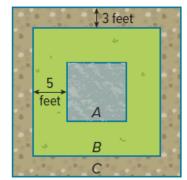
17. $3^x > 243$

18. $16^v \leq \frac{1}{4}$

19. $8^{y+4} > 15$

20. $2^x < 25$

45. USE A MODEL Anita's yard is being professionally landscaped. The final design will consist of a circular fountain x feet in diameter in square A surrounded by a grassy area in square B and a gravel pathway in square C that borders the grassy area. The square areas will be centered on each other as shown in the diagram. Square A will have a side length of $2x$ feet.

a. Anita would like the lengths of the sides to be proportional. For what values of x will the ratio of the lengths of a side of square C to a side of square B equal the ratio of the lengths of a side of square B to a side of square A? Explain your reasoning. What diameter could the fountain have?

b. If the landscape architect changed the width of the gravel pathway to 4 feet and the width of the grassy area to 2 feet, is there a value for x that would make the ratios equal? Explain your reasoning. What diameter could the fountain have?

🧠 Higher-Order Thinking Skills

46. ANALYZE Compare and contrast $\dfrac{(x-6)(x+2)(x+3)}{x+3}$ and $(x-6)(x+2)$.

47. FIND THE ERROR Troy and Beverly are simplifying $\dfrac{x+y}{x-y} \div \dfrac{4}{y-x}$. Is either of them correct? Explain your reasoning.

Troy

$$\frac{x+y}{x-y} \div \frac{4}{y-x} = \frac{x-y}{x+y} \cdot \frac{4}{y-x}$$
$$= \frac{-4}{x+y}$$

Beverly

$$\frac{x+y}{x-y} \div \frac{4}{y-x} = \frac{x+y}{x-y} \cdot \frac{y-x}{4}$$
$$= -\frac{x+y}{4}$$

48. **PERSEVERE** Find the expression that makes the following statement true for all values of x within the doman.

$$\frac{x-6}{x+3} \cdot \frac{?}{x-6} = x-2$$

49. **WHICH ONE DOESN'T BELONG?** Identify the expression that does not belong with the other three. Justify your conclusion.

| $\frac{1}{x-1}$ | $\frac{x^2+3x+2}{x-5}$ | $\frac{x+1}{\sqrt{x}+3}$ | $\frac{x^2+1}{3}$ |

50. **ANALYZE** Determine whether the following statement is *sometimes*, *always*, or *never* true. Justify your argument.

A rational function that has a variable in the denominator is defined for all real values of x.

51. **CREATE** Write a rational expression that simplifies to $\frac{x-1}{x+4}$.

52. **WRITE** The rational expression $\frac{x^2+3x}{4x}$ is simplified to $\frac{x+3}{4}$. Explain why this new expression is not defined for all values of x.

53. **CREATE** Write three different rational expressions that are equivalent to the expression $\frac{a}{a-5}$, $a \neq 5$.

38. $\dfrac{1}{12a} + 6 - \dfrac{3}{5a^2}$

39. $\dfrac{5}{16y^2} - 4 - \dfrac{8}{3x^2y}$

40. $\dfrac{5}{6x^2 + 46x - 16} + \dfrac{2}{6x^2 + 57x + 72}$

41. $\dfrac{1}{8x^2 - 20x - 12} + \dfrac{4}{6x^2 + 27x + 12}$

42. $\dfrac{x^2 + y^2}{x^2 - y^2} + \dfrac{y}{x + y} - \dfrac{x}{x - y}$

43. $\dfrac{x^2 + x}{x^2 - 9x + 8} + \dfrac{4}{x - 1} - \dfrac{3}{x - 8}$

44. $\dfrac{\dfrac{2}{a - 1} + \dfrac{3}{a - 4}}{\dfrac{6}{a^2 - 5a + 4}}$
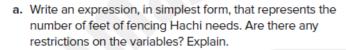
45. $\dfrac{\dfrac{1}{x} + \dfrac{1}{y}}{\left(\dfrac{1}{x} - \dfrac{1}{y}\right)(x + y)}$

Find the slope of the line that passes through each pair of points.

46. $A\left(\dfrac{2}{p}, \dfrac{1}{2}\right)$ and $B\left(\dfrac{1}{3}, \dfrac{3}{p}\right)$

47. $C\left(\dfrac{1}{4}, \dfrac{4}{q}\right)$ and $D\left(\dfrac{5}{q}, \dfrac{1}{5}\right)$

48. USE A MODEL Hachi needs to buy fencing for her rectangular garden.

   a. Write an expression, in simplest form, that represents the number of feet of fencing Hachi needs. Are there any restrictions on the variables? Explain.

   b. Hachi wants to remove a square corner from her garden. The square section removed will have sides the length of half the width of the original garden. What expression represents the perimeter of the new garden? Explain.

$\dfrac{x}{y - 2}$ feet

$\dfrac{3 + x}{y}$ feet

$\dfrac{x}{y - 2}$ feet

$\dfrac{3 + x}{y}$ feet

Example 1

Determine the excluded value of x for each function.

1. $f(x) = \frac{5}{x}$

2. $g(x) = \frac{-2}{x+2}$

3. $f(x) = \frac{10}{x-3}$

4. $g(x) = \frac{5}{-6x}$

5. $f(x) = \frac{5}{2x+3}$

6. $g(x) = \frac{5}{7x-9}$

Example 2

Identify the asymptotes, domain, and range of each function. Then graph the function and identify its intercepts.

7. $f(x) = \frac{1}{x-1}$

8. $f(x) = -\frac{1}{x} + 4$

9. $f(x) = \frac{5}{x+4}$

10. $f(x) = \frac{6}{x} - 3$

Example 3

11. PLANES A plane is scheduled to leave Dallas for an 800-mile flight to Chicago's O'Hare airport. However, the departure is delayed for two hours.

    a. If $t = 0$ represents the scheduled departure time, write a function that represents the plane's average speed r on the vertical axis as a function of travel time, t, which is based on the travel from the scheduled departure time to the destination. Graph the function.

    b. Analyze the key features of the graph in the context of the situation.

Example 4

Graph each function. State the domain and range.

13. $f(x) = \frac{1}{x+3} - 3$

14. $f(x) = \frac{-1}{x+5} - 6$

15. $f(x) = \frac{-1}{x+1} + 3$

16. $f(x) = \frac{1}{x+4} - 2$

19. $3 - \frac{4}{x} > \frac{5}{4x}$

20. $\frac{5}{3a} - \frac{3}{4a} > \frac{5}{6}$

21. $\frac{x-2}{x+2} + \frac{1}{x-2} > \frac{x-4}{x-2}$

22. $\frac{3}{4} - \frac{1}{x-3} > \frac{x}{x+4}$

23. $\frac{x}{5} + \frac{2}{3} < \frac{3}{x-4}$

24. $\frac{x}{x+2} + \frac{1}{x-1} < \frac{3}{2}$

Example 7

25. ORIGAMI For prom, Muna wants to fold 1000 origami cranes. She is asking volunteers to help and does not want to make anyone fold more than 15 cranes.

    a. Write an inequality to represent this situation, if *N* is the number of people enlisted to fold cranes.

    b. What is the minimum number of people that will satisfy the inequality in **part a?**

26. PROM Caleb manages the budget for his school's junior prom. His class has spent $1250 for the prom venue, $625 for a DJ, and $1470 for decorations. They will also serve dinner before the dance, which costs $12 per student. If he wants to keep the cost of prom tickets less than $20, how many students will need to buy tickets?

27. HEIGHT Fabiana is 8 inches shorter than her sister Pilar, or 12.5% shorter than Pilar. How tall is Fabiana?

Solve each equation or inequality. Check your solutions.

28. $\frac{x-2}{x+4} > \frac{x+1}{x+10}$

29. $\frac{3}{k} - \frac{4}{3k} = 0$

30. $2 - \frac{3}{v} = \frac{5}{v}$

31. $n + \frac{3}{n} < \frac{12}{n}$

32. $\frac{1}{2m} - \frac{3}{m} < -\frac{5}{2}$

33. $\frac{1}{2x} < \frac{2}{x} - 1$

34. $\frac{6}{x+2} = \frac{x-7}{x+2} + \frac{1}{4}$

35. $\frac{t-5}{t-3} = \frac{t-3}{t+3} + \frac{1}{t-3}$

36. $3 + \frac{2}{t} > \frac{8}{t}$

37. $\frac{6}{m+5} > 2$

Example 1

Identify each sample, and suggest a population from which it was selected. Then classify the sample as *simple random, systematic, self-selected, convenience,* or *stratified.* Explain your reasoning.

1. Berton divides his sports T-shirts by team. Then he randomly selects four T-shirts from each team and records the size.

2. The project manager at a new business inspects every tenth smart phone produced to check that it is operating correctly.

3. A grocery store manager asks its customers to submit suggestions for items on the salad bar during the week.

Identify each sample or question as *biased* or *unbiased.* Explain your reasoning.

4. A random sample of eight people is asked to select their favorite food for a survey about Americans' food preferences.

5. Every tenth student at band camp is asked to name his or her favorite band for a survey about the campers.

6. Every fifth person entering a museum is asked to name his or her favorite type of book to read for a survey about reading interests of people in the city.

7. Do you think that the workout facility needs a new treadmill and racquetball court?

8. Which is your favorite type of music, pop, or country?

9. Are you a member of any after-school clubs?

10. Don't you agree that employees should pack their lunch?

**Classify each sample as *simple random, systematic, self-selected, convenience,* or *stratified.*
Then determine whether each situation describes a *survey,* an *observational study,* or an
*experiment.***

21. To determine the music preferences of their customers, the manager of a music store
    selected 10 customers in the store to participate in an interview.

22. Administrators at a community library want to know the type of materials patrons
    are most likely to use. Every Friday, they record the type of media each patron
    uses.

23. To determine whether the school should purchase new computer software, the
    technology team divides a group of 50 students into two groups by age. Half of
    the students from each age group are randomly selected to complete an activity
    using the current computer software, and the other half of the students from each
    group complete the same activity using the new computer software. The students'
    actions are recorded and analyzed.

1. A student spun a spinner with 4 equal sections 100 times and recorded the results.

Spinner Section	Frequency
Red	35
Blue	38
Green	13
Yellow	14

   a. Find the theoretical probability of spinning blue. Write your answer as a percentage rounded to the nearest tenth, if necessary.

   b. Find the experimental probability of spinning blue. Write your answer as a percentage rounded to the nearest tenth, if necessary.

2. A student flipped a coin 125 times and recorded the results.

Coin Result	Frequency
Heads	73
Tails	52

   a. Find the theoretical probability of the coin landing on heads. Write your answer as a percentage rounded to the nearest tenth, if necessary.

   b. Find the experimental probability of the coin landing on heads. Write your answer as a percentage rounded to the nearest tenth, if necessary.

3. A fair 6-sided die is rolled 150 times.

Number on Die	Frequency
1	32
2	18
3	27
4	16
5	33
6	24

   a. Find the theoretical probability of rolling a 3. Write your answer as a percentage rounded to the nearest tenth, if necessary.

   b. Find the experimental probability of rolling a 3. Write your answer as a percentage rounded to the nearest tenth, if necessary.

Examples 2 and 3

4. INTERNET Tiana sells handmade earrings online. Last month she sold 60% of her inventory. Design and run a simulation that can be used to estimate the probability of selling inventory.

5. PROGRAMMING Lamar designed a soccer computer game. He coded the program such that a player will make a goal on 35% of the attempts. Paola is testing the game and thinks there may be an error in the game's programming. She attempted to make 30 goals and only 4 were successful. Run and evaluate a simulation, and decide whether Paola is correct.

1. BARBER A barber wants to purchase new professional shears from a Web site. The prices of all of the shears are shown in the table. Use the standard deviation formula to find and interpret the standard deviation of the data. Round your answers to the nearest cent.

Cost of Shears ($)			
50	165	55	79
84	68	38	42

2. READING Ms. Sanchez keeps track of the total number of books each student in the book club reads during the school year. Use the standard deviation formula to find and interpret the standard deviation of the data. Round your answers to the nearest tenth.

Books Read		
9	6	12
8	9	14
10	13	8

Example 2
Use a graphing calculator to find the mean and standard deviation of each set of data. Round to the nearest tenth.

3. 20, 23, 24, 23, 22, 25, 21, 23, 24, 22, 21, 23, 22, 24

4. 150, 153, 125, 136, 143, 150, 166, 148, 150, 173, 150, 153, 143, 142, 153

5. 9.0, 3.8, 6.2, 7.1, 5.3, 6.2, 7.1, 8.2, 7.1, 4.5, 9.9, 8.2

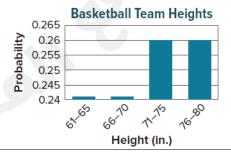**6.** 3350, 2800, 4525, 2150, 2800, 2150, 3350, 1800, 5250, 3975, 580, 2800

Identify the random variable in each distribution, and classify it as *discrete* or *continuous*. Explain your reasoning.

1. the number of texts received per week

2. the number of "likes" for a Web page

3. the height of a plant after a specific amount of time

Examples 2-4

4. FUNDRAISING At a fundraising dinner, the underside of 200 plates were randomly tagged with a sticker to indicate winning a cash prize. The frequency table shows the number of winning plates for each prize. Construct a relative frequency table, and graph the probability distribution.

Prize, (X)	Frequency
$5	150
$50	40
$100	9
$1000	1

5. BASKETBALL An athletic director made a probability distribution of the heights of her team's basketball players, and distributed a flyer that claimed that the majority of the players on the basketball team are 71 inches or taller. Identify any flaws in the representation of the probability distribution.

Basketball Team Heights

6. TRACK The preliminary times for a 110-meter hurdles race are shown. Create a histogram of the set of data. Determine whether the data can be approximated with a normal distribution.

Times (seconds)
14.75, 14.77, 14.31, 14.83, 14.84,
14.35, 14.69, 14.63, 14.74,
14.82, 14.25, 14.93

Example 5

7. A normal distribution has a mean of 186.4 and a standard deviation of 48.9.

    a. What range of values represents the middle 99.7% of the data?

    b. What percent of data will be greater than 235.3?

    c. What range of values represents the upper 2.5% of the data?

Example 6

Find the z-value for each standard normal distribution.

  8. $\sigma = 9.8$, $X = 55.4$, and $\mu = 68.34$

  9. $\sigma = 11.6$, $X = 42.80$, and $\mu = 68.2$

10. $\sigma = 11.9$, $X = 119.2$, and $\mu = 112.4$

Example 7

Use a table to find the area under the normal curve for each interval.

  11. $z > 0.58$ **12.** $z < -1.56$ **13.** $-2.29 < z < 2.76$

52. TRANSPORTATION A traffic roundabout has a diameter of 200 meters. How far does an automobile travel in the roundabout if it goes one-fourth of the way around?

53. ANALOG CLOCKS The length of the minute hand of an analog clock is 5 inches. If the minute hand rotates from 12 noon to 12:40 P.M., then how far does its point move?

Mixed Exercises

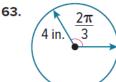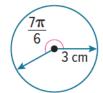**REGULARITY Rewrite each degree measure in radians and each radian measure in degrees.**

54. $18°$ **55.** $6°$ **56.** $-72°$

57. $-820°$ **58.** 4π **59.** $\frac{5\pi}{2}$

60. $-\frac{9\pi}{2}$ **61.** $-\frac{7\pi}{12}$ **62.** $-270°$

Find the length of each arc. Round to the nearest tenth.

63.

$\frac{2\pi}{3}$ 4 in.

64.

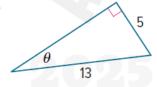$\frac{7\pi}{6}$ 3 cm

65.

$\frac{4\pi}{3}$ 3 ft

66. TIME Find both the degree and radian measures of the angle through which the hour hand on a clock rotates from 5 A.M. to 10 P.M.

67. ROTATION A truck with 16-inch radius wheels is driven at 77 feet per second (52.5 miles per hour). Find the measure of the angle through which a point on the outside of the wheel travels each second. Round to the nearest degree and nearest radian.

68. PLANETS Earth makes one full rotation on its axis every 24 hours. How long does it take Earth to rotate through 150°? Neptune makes one full rotation on its axis every 16 hours. How long does it take Neptune to rotate through 150°?

69. SURVEYING If a surveyor's wheel with a diameter of 19 inches completes $\frac{5}{6}$ of a rotation, what is the total distance traveled in inches? Round to the nearest hundredth if necessary.
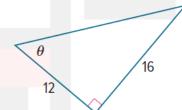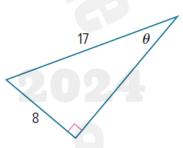
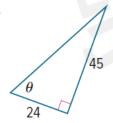**Find the exact values of the six trigonometric functions for angle θ.**

1.

5
θ
13

2.

θ
12
16

3.

17
θ
8

4.

45
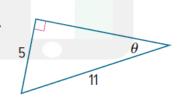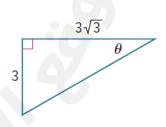θ
24

5.

5
θ
11

6.

$3\sqrt{3}$
θ
3

In a right triangle, $\angle A$ and $\angle B$ are acute. Find the values of the five remaining trigonometric functions.

7. $\tan A = \frac{8}{15}$

8. $\cos A = \frac{3}{10}$

9. $\tan B = 3$

10. $\sin B = \frac{4}{9}$

11. $\cos A = \frac{1}{2}$

12. $\sin A = \frac{15}{17}$

Example 2

Find the amplitude and period of each function.

5. $y = 2 \cos \theta$

6. $y = 2 \sin \theta$

7. $y = \cos \frac{1}{2}\theta$

8. $y = \frac{3}{4} \cos \theta$

9. $y = \frac{1}{2} \sin 2\theta$

10. $y = 3 \cos 2\theta$

Examples 3 and 4

Find the amplitude and period of each function. Then graph the function.

11. $y = 3 \sin \theta$

12. $y = \cos 3\theta$

13. $y = \sin 4\theta$

14. $y = \frac{3}{2} \sin \theta$

15. $y = 4 \cos 2\theta$

16. $y = 5 \sin \frac{2}{3}\theta$