

Lern 48-49 Final Review Exercises

In order to be prepared for the final exam, students should be able to do all of the following problems and related problems as well. Students are expected to know:

- Perimeter and area formulas for triangles, rectangles, and squares
- Simple interest
- Mean, median, and mode for a set of numbers
- Relationship between the radius and the diameter of a circle
- Relationships in similar figures, including similar triangles
- Relationships involving angles: complementary, supplementary, vertical
- Relationships involving angles formed by parallel lines and a transversal

Be sure to include proper units. Simplify all fractions, if possible. Unless otherwise instructed in a problem, you may represent an answer as either an improper fraction or a mixed number. Neither is “simpler.”

1. Round to the indicated place.

- 19,384 to the nearest hundred
- 264,980 to the nearest ten thousand
- 7834.0629 to the nearest thousandth
- 9.548 to the nearest tenth
- 0.395 to the nearest hundredth

2. Place the appropriate symbol $<$, $>$, or $=$ between the two numbers.

- | | | | |
|----------|-------|------------|----------|
| a. 18 | 81 | e. -0.07 | -0.007 |
| b. 0 | -50 | f. $ -6 $ | $ 6 $ |
| c. -3 | -5 | g. $ 3 $ | $ -7 $ |
| d. 4.058 | 4.06 | | |

- 3.
- Express 42 as a product of prime factors.
 - Express 60 as a product of prime factors.
 - Find the LCM of $42x$ and $60x^3$.

4. Perform the indicated operations. Simplify your answer, if possible.

a. $\frac{17}{10} + \frac{17}{5}$

b. $\frac{5}{12} - \frac{7}{15}$

c. $8\frac{1}{6} - 4\frac{5}{9}$

d. $\frac{16}{27} + \frac{5}{12}$

e. $\frac{2}{35} \cdot \frac{-5}{12}$

f. $\frac{3}{5} \div 12$

g. $4\frac{1}{3} \div 2\frac{5}{6}$

h. $\left(\frac{3}{5}\right)^2 - \frac{2}{5} \div \frac{3}{4}$

i. $\frac{(-4)^2 - 4(-6)}{2(-3 - 2)}$

j. $\frac{2 \cdot 4 - 1}{\frac{7}{3}}$

k. $\frac{\frac{x^3}{25}}{\frac{x}{5}}$

5. Evaluate each of the following expressions. Simplify your answer, if possible.

a. $9\frac{2}{9} - x$ for $x = 6\frac{2}{3}$

b. x^2 for $x = -7$

c. $-x^2$ for $x = 7$

d. $\frac{x^2 - y^2}{2}$ for $x = -6$ and $y = -8$

e. $\frac{2x + y^2}{-7}$ for $x = -1$ and $y = -4$

6. Write in decimal notation: *Seven thousand nine and one hundred twenty-eight thousandths*

7. Translate the following into mathematical symbols.

a. The square of eight

b. Seven cubed

c. A number increased by six

d. Six **greater than** a number

e. Six **is greater than** a number

f. Nine more than double a number

g. Two times the sum of a number and ten

h. The sum of two times a number and ten

i. The difference of five and a number

j. Five decreased by a number

k. Five subtracted from a number

l. Five **less than** a number

m. Five **is less than** a number

n. Triple a number minus one

o. Twice a number decreased by three

p. Seven less than four times a number

q. The product of six and a number

r. The quotient of a number and nine

s. A number divided by nine

t. A number divided into nine

8. Perform the indicated operations.

a. $-6 - 3 + 8$

b. $-9 - (-11) - 7 - 2 + 4$

c. $4 - 5 - (-1)$

d. $-3^2 + 4(-3)$

e. $9 - 5(4 - 8)$

f. $(-5)(2)(-3)(-1)(-5)(-4)$

g. $-24 \div 6 \cdot 2$

h. $4 \div 0$

i. $\frac{0}{12}$

j. $\frac{8}{0}$

k. $0 \div 13$

l. $35 - 15 \div (-5)(-3)^2 + 4$

m. $3400 + 17 \cdot 400 \div 5^2 - 3^2$

n. $(-5)^3 + 6(3 - 12 \div 3)$

9. Solve.

a. $x - 45 = -13$

b. $-32x = -160$

c. $9x + (-5x) = -52$

d. $3x - 6 = -21$

e. $0.5x - 1.45 = 2.1$

f. $\frac{9}{x} = \frac{51}{34}$

10. Perform the indicated operations.

a. $2.73 + 25 + 0.048$

b. $-11.59 - (-3.6)$

c. $-14 + 3.1 - 2.7 \times 0.3$

d. $26 - 2.3(3 + 3.5 \div 1.25)$

e. $(-0.4)^3$

11. Perform the operations indicated.

a. $4(7a)$

b. -5^2

c. $\frac{24x^3y^8}{16x^5y}$

d. $(4x)(-3y)(-6x)$

e. $-3(x \cdot 5)$

f. $(-2x^2)(2x^2)(-3x)(-4x^4)$

g. $(x^0)^{10}$

h. $(y^3)^7$

i. $5^8 \cdot 5 \cdot 5^2$

12. Place the appropriate symbol $<$, $>$, or $=$ between the two numbers.

a. 0.0803 0.803

b. $|0.03|$ $-|0.3|$

c. $-(-2)$ $|-2|$

13. Perform the operations indicated.

a. $(9x - 3) + (4x + 15)$

c. $(6x^2 - 2x + 7) - (x^2 - 3x)$

b. $(3a - 4b - 5) - (-4b + 9)$

d. $8z - 2(z - 4)$

14. Simplify.

a. $4(a - 7)$

b. $-3x(2x - 5y + 1)$

c. $(5y^5 - 3)(-2y^2)$

d. $x^7(6x^5 + x - 8)$

15. Solve.

a. $3y - 5 = 7y - 2$

e. $14x = -2x + 16$

b. $3(2x + 8) - 7x = 30$

f. $(4x^2 - 1) - (4x^2 - x + 2) = -3$

c. $-2y + \frac{1}{4} = \frac{2}{3}$

g. $-\frac{3}{4}x = 4$

d. $4(x - 1) = -6(x + 2) + 48$

16. Complete the table of equivalent notations.

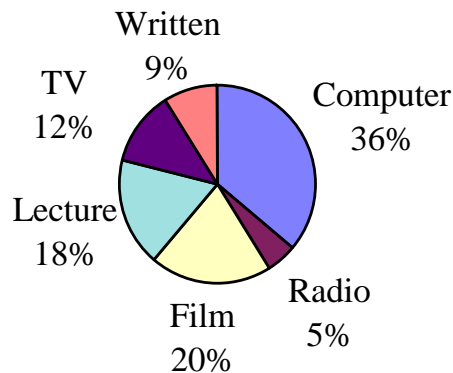
Fraction	Decimal	Percent
$\frac{8}{9}$		
	0.189	
		64.05%
$8\frac{3}{4}$		

The remaining problems on this review should include proper units.

17. A small apartment complex has 8 one-bedroom apartments. The monthly rents of these apartments are \$600, \$720, \$560, \$740, \$1120, \$580, \$740, and \$820. Find the mean, median, and mode.
18. Debbie had 2600 feet of ribbon to decorate carnival baskets. If she needed 24 feet of ribbon for each basket, how many baskets could she decorate and how much ribbon did she have left over?
19. The Pleasantville Country Club maintains the putting greens with a grass height of $\frac{7}{8}$ inch.

The grass on the fairways is maintained at $2\frac{1}{2}$ inches. How much must the blade be lowered by a person mowing the fairways if that person will be using the same mowing machine on the putting green?
20. The temperature of a small lake in Michigan was 12°F at 8 pm. If the temperature of the lake dropped 5 degrees every hour for the next 3 hours and then dropped another two degrees the fourth hour, what was the temperature of the lake at midnight?
21. T. B. Etron's Company made \$782,535 last year. The expenses for that year were \$600,333. How much profit did the company make? If the 3 owners divided the profits equally, how much money did each owner receive?

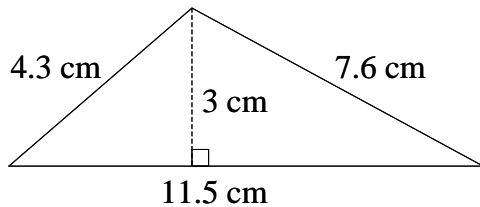
For Problems 22-25, use the circle graph (pie chart) below. In a school of 1200 students, a survey of students indicated the following preferences for instructional methods.



22. What percent of the students preferred either TV or film?
23. Which type of instructional method was least preferred by students?
24. Of the 1200 students, how many preferred lecture?
25. How many more of the 1200 students preferred film than preferred radio?

26. Find the area and perimeter of a square with each side $2\frac{3}{8}$ inches.

27. Find the area and perimeter of the triangle shown below.



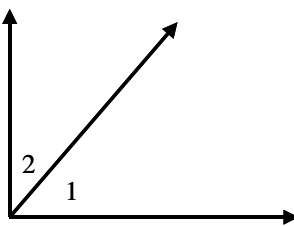
28. Find the area and circumference of a circle with a radius of 8 km. Use $\pi \approx 3.14$. Round your answer to the nearest tenth. $A = \pi r^2$ $C = 2\pi r$

29. Find the area and circumference of a circle with a diameter of 24 yd. Use $\pi \approx 3.14$. Round your answer to the nearest tenth. $A = \pi r^2$ $C = 2\pi r$

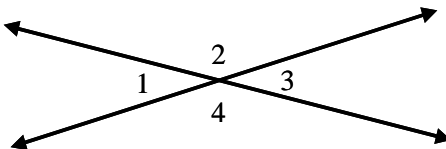
30. Find the volume of a rectangular solid with length = 13 feet, width = 7 feet, and height = 10 feet. $V = LWH$

31. Find the volume of a sphere with radius 5 m. Use $\pi \approx 3.14$. Round your answer to the nearest hundredth. $V = \frac{4\pi r^3}{3}$

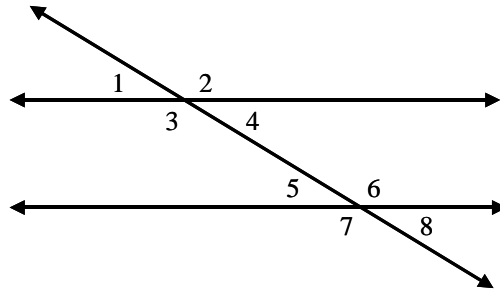
32. Angle 1 and angle 2 are complementary angles. If angle 1 measures 57.4° , find the measure of angle 2.



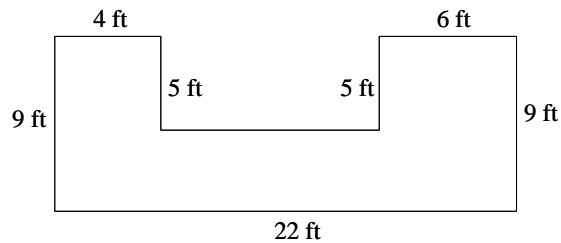
33. Find the measure of angles 1, 2, and 4 in the figure below, if the measure of angle 3 is 37.5° .



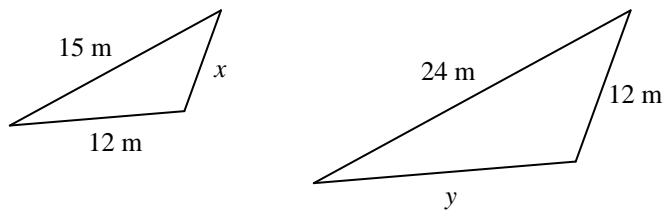
34. Find the measure of angles 1, 2, 3, 4, 5, 6, and 7 in the figure below, if the measure of angle 8 is 42° .



35. Find the area and perimeter of the shape below:



36. The triangles below are similar. Find the length of the sides marked x and y .



37. Pat bought 3 planters for \$12.98 each, 15 flowering plants at \$2 each, and 2 bags of potting soil at \$3.95 each. How much money did Pat spend for her purchases?
38. A stadium which had 4500 seats last year was remodeled. If the stadium has 27% more seats this year, how many seats does the remodeled stadium have?
39. Malik is paid 8% commission based on the dollar amount of sales he makes. If Malik earned \$1000 in commission, what were his total sales?
40. Marina buys a couch for \$835. If the sales tax rate is 7.5%, what is Marina's bill? Round your answer to the nearest cent.
41. Joaquin gets a loan for \$500 at an interest rate of 12%. How much interest does Joaquin pay if the loan is paid back in 6 months?
42. The tanning salon has a special on their tanning sessions: 12 sessions for \$102 or 15 sessions for \$135.
- Find each unit price.
 - Which is the better deal?

43. If $2\frac{1}{4}$ gallons of ice cream contain 360 grams of fat, how much fat is in $3\frac{1}{2}$ gallons of ice cream?
44. Salima is house-sitting while her friend is gone for the weekend. Salima charges \$0.75 per hour. She will stay $2\frac{1}{2}$ days. How much will her friend owe her at the end of that time?
45. A new drug costs \$72 per gram. How much would it cost to buy 2 kilograms of the drug?
46. Jessie has a rope that is $34\frac{1}{3}$ feet long. To put up tents for a camping trip, Jessie must cut 5 pieces of rope, each $6\frac{3}{8}$ feet in length. (Write your answers as mixed numbers.)
- How much rope is needed to make the 5 pieces of rope to be used for the tents?
 - How much rope will be left after the 5 pieces of rope are cut and used?
47. If the sum of eight and a number is multiplied by six, the result is 186.
- Write an equation.
 - Solve the equation.
48. If triple a number is decreased by four, the result is 47.
- Write an equation.
 - Solve the equation.
49. A triangle has a perimeter of 46 meters. The first side of the triangle is four meters longer than the second side. The third side is 10 meters shorter than double the second side.
- Define the variable expressions.
 - Write an equation.
 - Solve the equation and find the length of each side of the triangle.
50. The perimeter of a rectangle is 212 inches. The length is 5 inches less than twice the width.
- Define the variable expressions.
 - Write an equation.
 - Solve the equation and find the dimensions of the rectangle.
51. The total flying time for two flights is 12 hours. The flight time of the first flight is half of the second.
- Define the variable expressions.
 - Write an equation.
 - Solve the equation and find the length of each flight.
52. Last year a total of 84 students took Latin. Six fewer students took Latin in the summer than in the spring. Three times as many students took Latin in the fall as in the spring.
- Define the variable expressions.
 - Write an equation.
 - Solve the equation and find the number of students who took Latin each semester.

ANSWERS:

1. a. 19,400
b. 260,000
c. 7834.063
d. 9.5
e. 0.40
2. a. $18 < 81$
b. $0 > -50$
c. $-3 > -5$
d. $4.058 < 4.06$
e. $-0.07 < -0.007$
f. $|-6| = |6|$
g. $|3| < |-7|$
3. a. $42 = 2 \cdot 3 \cdot 7$
b. $60 = 2 \cdot 2 \cdot 3 \cdot 5$ or $2^2 \cdot 3 \cdot 5$
c. $420x^3$
4. a. $\frac{51}{10}$ or $5\frac{1}{10}$
b. $-\frac{1}{20}$
c. $3\frac{11}{18}$ or $\frac{65}{18}$
d. $\frac{109}{108}$ or $1\frac{1}{108}$
e. $\frac{-1}{42}$ or $-\frac{1}{42}$
f. $\frac{1}{20}$
g. $\frac{26}{17}$ or $1\frac{9}{17}$
h. $\frac{-13}{75}$ or $-\frac{13}{75}$
i. -4
j. 3
k. $\frac{x^2}{5}$
5. a. $2\frac{5}{9}$
b. 49
c. -49
d. -14
e. -2
6. 7009.128
7. a. 8^2
b. 7^3
c. $x + 6$
d. $x + 6$
e. $6 > x$
f. $2x + 9$
g. $2(x + 10)$
h. $2x + 10$
i. $5 - x$
j. $5 - x$
k. $x - 5$
l. $x - 5$
m. $5 < x$
n. $3x - 1$
o. $2x - 3$
p. $4x - 7$
q. $6x$
r. $\frac{x}{9}$ or $x \div 9$
s. $\frac{x}{9}$ or $x \div 9$
t. $\frac{9}{x}$ or $9 \div x$

8. a. -1
b. -3
c. 0
d. -21
e. 29
f. -600
g. -8
h. undefined
i. 0
j. undefined
k. 0
l. 66
m. 3663
n. -131

9. a. $x = 32$
b. $x = 5$
c. $x = -13$
d. $x = -5$
e. $x = 7.1$
f. $x = 6$

10. a. 27.778
b. -7.99
c. -11.71
d. 12.66
e. -0.064

11. a. $28a$
b. -25
c. $\frac{3y^7}{2x^2}$
d. $72x^2y$
e. $-15x$
f. $-48x^9$
g. 1
h. y^{21}
i. 5^{11}

12. a. $<$
b. $>$
c. $=$

13. a. $13x + 12$
b. $3a - 14$
c. $5x^2 + x + 7$
d. $6z + 8$

14. a. $4a - 28$
b. $-6x^2 + 15xy - 3x$
c. $-10y^7 + 6y^2$
d. $6x^{12} + x^8 - 8x^7$

15. a. $y = \frac{-3}{4}$ or $y = -\frac{3}{4}$
 b. $x = -6$
 c. $y = \frac{-5}{24}$ or $y = -\frac{5}{24}$
 d. $x = 4$
 e. $x = 1$
 f. $x = 0$
 g. $x = \frac{-16}{3}$ or $y = -\frac{16}{3}$

16.

Frac.	Dec.	Per.
$\frac{8}{9}$	$0.8\overline{88}$ or $0.\overline{8}$	$88.\overline{8}\%$
$\frac{189}{1000}$	0.189	18.9%
$\frac{1281}{2000}$	0.6405	64.05%
$8\frac{3}{4}$	8.75	875%

17.

Mean: \$735

Median: \$730

Mode: \$740

18. 108 baskets with 8 feet left

19. $1\frac{5}{8}$ inch

20. -5°F

21. \$182,202; \$60,734

22. 32%

23. Radio

24. 216 Students

25. 180 Students

26. Area: $\frac{361}{64}$ in² or $5\frac{41}{64}$ in²

Perimeter: $\frac{19}{2}$ in or $9\frac{1}{2}$ in

27. Area: 17.25 cm^2

Perimeter: 23.4 cm

28. Area: 201.0 km^2

Circumference: 50.2 km

29. Area: 452.2 yd^2

Circumference: 75.4 yd

30. Volume: 910 ft^3

31. Volume: 523.33 m^3

32. $m\angle_2 = 32.6^\circ$

$m\angle_1 = 37.5^\circ$

33. $m\angle_2 = m\angle_4 = 142.5^\circ$

$m\angle_1 = m\angle_4 = m\angle_5 = 42^\circ$

34. $m\angle_2 = m\angle_3 = m\angle_6 = m\angle_7 = 138^\circ$

35. Area: 138 ft^2

Perimeter: 72 ft

36. $x = 7.5\text{ m}$ and $y = 19.2\text{ m}$

37. \$76.84

38. 5715 Seats

39. \$12,500

40. \$897.63

41. \$30

42. a. \$8.50 per session

\$9 per session

b. 12 sessions for \$102

43. 560 g of fat
44. \$45
45. \$144,000
46. a. $31\frac{7}{8}$ feet
 b. $2\frac{11}{24}$ feet
49. a. length of side 1 = $n + 4$
 length of side 2 = n
 length of side 3 = $2n - 10$
 b. $(n + 4) + n + (2n - 10) = 46$
 c. length of side 1 = 17 meters
 length of side 2 = 13 meters
 length of side 3 = 16 meters
50. a. width = n
 length = $2n - 5$
 b. $2(2n - 5) + 2n = 212$
 c. width = 37 inches
 length = 69 inches
51. a. length of flight 1 = $\frac{1}{2}n$
 length of flight 2 = n
 b. $\frac{1}{2}n + n = 12$
 c. length of flight 1 = 4 hours
 length of flight 2 = 8 hours
52. a. number of fall students = $3n$
 number of spring students = n
 number of summer students = $n - 6$
 b. $(3n) + n + (n - 6) = 84$
 c. number of fall students = 54 students
 number of spring students = 18 students
 number of summer students = 12 students
47. a. $6(8 + n) = 186$
 b. $n = 23$
48. a. $3n - 4 = 47$
 b. $n = 17$