**MONTGOMERY COLLEGE MATH DEPARTMENT**
**MA 090 FINAL REVIEW**

## NOTE: A CALCULATOR IS ALLOWED DURING THE FINAL EXAM.

### ROUNDING

**Round to the given place value**.

| | | a) hundreds | b) tens | c) whole number | d) tenths | e) thousandths |
|---|---|---|---|---|---|---|
| 1. | 5281.7851 | | | | | |
| 2. | 19,845.6597 | | | | | |

### ORDER OF OPERATIONS

**Simplify**.

3. $6(4+2\cdot 3)-7(4^2-9)$
4. $84\div 2\cdot 3-3^2$
5. $84\cdot 2\div 3-3^2$
6. $(3+4)^2-9^2$
7. $3+4(-1+7)\div 2^3$
8. $\dfrac{10(-1)-(-2)(-3)}{2[-8\div(-2-2)]}$
9. $(-10.12)+5.76\div 4.8$
10. $5(-3.75)-(-12.4)$
11. $(-2.2)+(-3.1)(-4.7)(-5.9)$
12. $-8.2-4.3^2$
13. $2.75+5.733(-1.8+7)\div 2.1^2$
14. $\dfrac{10.5(-0.5)-(-2.5)(-3.5)}{2[-8\div(-1.3-2.7)]}$
15. $\dfrac{1}{5}-2(7.8)$
16. $\dfrac{1}{4}(-9.6-5.2)$
17. $\dfrac{3}{4}-(9.6)(5)$

**Insert either <, > or = between the pair of numbers to make a true statement**.

18. $-2.5$_____$-2.51$
19. $|-9.7|$_____$|-14.7|$
20. $|-33.5|$_____$-(-33.5)$
21. $-|-10.2|$____$-(-10.2)$
22. $\dfrac{1}{3}$____$0.3$
23. $0.625$____$\dfrac{5}{8}$
24. $\dfrac{5}{9}$____$0.557$
25. $0.58\overline{3}$____$\dfrac{6}{11}$
26. $65\%$____$\dfrac{13}{20}$

27. **Write the given numbers in order from smallest to largest**:

a) $-\dfrac{29}{2}$, $-14.8$, $-14.7$;
b) $\dfrac{5}{12}$, $0.375$, $\dfrac{19}{48}$;
c) $153\%$, $1.6$, $1\dfrac{1}{2}$

### ALGEBRAIC EXPRESSIONS

**Simplify**.

28. $-8a-3t+5a-t$
29. $3(5x-2)+4(3-7x)$
30. $7(2x+3)-6(3x-1)$
31. $-2.5(2x-5y-4)$
32. $-5.7x-(-2.6x)+6.9x$
33. $2(3x+1.5)+5(x-2.2)$

34. $\frac{2x}{3}+\frac{x}{3}$ 35. $2.5a-0.5b-4.4+4.1a+1.5b-3$

36. Evaluate the expression for x = $\frac{1}{4}$, $y=-2$: a) $-x^2-y$ b) $\frac{2-4x}{y}$

37. Evaluate the expression for $x=-0.5$ and $y=-1.5$: a) $x^2-2y$ b) $\frac{6-2x}{x-y}$

**FRACTIONS**

**Perform the following operations. Write answers in lowest terms. SHOW ALL WORK.**

38. $-\frac{7}{12}+\frac{5}{12}-\frac{1}{12}$ 39. $\frac{2}{15}+\frac{3}{10}$ 40. $\left(\frac{-7}{15}\right)\div\left(\frac{-2}{3}\right)$ 41. $6-3\frac{2}{7}$

42. $-2\frac{7}{9}\cdot 1\frac{4}{5}$ 43. $\frac{-4}{5}\div 4$ 44. $\left(-\frac{2}{3}\right)^3$ 45. $\frac{2}{3}-\frac{2}{9}-\frac{1}{6}$

**Complete the chart**. **Simplify all fractions.**

| | Fraction | Decimal | Percent |
|---|---|---|---|
| 46. | | | 5.4% |
| 47. | | 0.36 | |
| 48. | | 3.4 | |

**AREA AND PERIMETER**

49. Find the perimeter and area of each rectangle. Give correct units.

a) length is $\frac{1}{2}$ mile and width is $\frac{1}{4}$ mile b) length is 18.5 cm and width is 11.8 cm

**EQUATIONS**

**Solve and check.**

50. $-4x-3=5$ 51. $2(3-y)+4y=-6$ 52. $1-8x=-5-6x$ 53. $9-3x=14+2x$

54. $\frac{2}{3}t-4=2$ 55. $10+\frac{1}{4}x=5$ 56. $\frac{x}{5}-1=\frac{7}{5}$ 57. $-3.5x+2.8=-11.2$

58. $2(x-1.3)=5.8$ 59. $2.1x+5=1.6x+10$ 60. $6x+8.65=3x+10$ 61. $4x+7.6=2(3x-3.2)$

62. $\frac{30}{10}=\frac{15}{x}$ 63. $\frac{7}{x}=\frac{25}{100}$ 64. $\frac{x}{24}=\frac{96}{60}$ 65. $\frac{1}{2}-\frac{3}{5}=\frac{x}{10}$

**Write the following as an equation and solve**.

66. Five times the sum of a number and ten is thirty. Find the number.

67. The sum of five times a number and ten is thirty. Find the number.

68. Eight times a number subtracted from twelve is negative twelve. Find the number.

69. The quotient of a number and 8 is –12. Find the number.

**RATIO & PROPORTION**

70. A package of 8 boxes of tissues costs $9.99. Find the unit price. Round to the nearest cent.

71. Denise's car can travel 450 miles on 12 gallons of gas. She wants to take trip of 1000 miles. Approximately how much gas will her car use? Round your answer to the nearest tenth.

72. A 120 pound person should eat a minimum of 44 grams of protein each day. How much protein should a 180 pound person eat each day?

**PERCENTS**

73. Twelve is what percent of 60? 74. $62\frac{1}{2}\%$ of 40 is what number? 75. 15% of what number is 30?

76. A final exam consists of 120 questions, of which 70% are multiple choice. How many multiple choice questions are there?

77. Mrs. Brown paid a commission of $7\frac{1}{2}\%$ of the selling price to the real estate agent who sold her home. If the selling price was $140,000 how much commission did Mrs. Brown pay?

78. Craig purchased a car for $12,000. If he paid $756 in sales tax, find the sales tax rate.

79. In 2000, the median household income in Rockville was $68,074. From 2000 to 2003, the median household income increased by 7.6%. What was the median household income in 2003? Round to the nearest dollar.

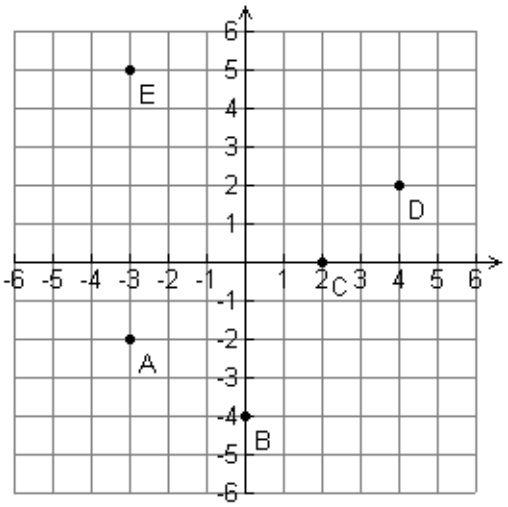
80. There are 600 cars in a used car lot.
    a) If 21 of the cars in the lot are 2-door coupes, what percent is this?
    b) If 180 of the cars in the lot are silver, what fraction is this? Write fraction in lowest terms.
    c) If 150 of the cars in the lot are SUV's, what percent are <u>not</u> SUV's?

**GRAPHS**

81. Plot these points on the *x*-*y* plane on graph paper and state the quadrant each lies in.

    A (–4,3), B (2,5), C (–1, –4), D (3, –3), E (0,3), F (3, 0)

82. Determine the ordered pairs of the labeled points.




83. Graph the following linear equations on a rectangular coordinate system. Label three ordered pairs.

a) $y = -2x + 3$ b) $y = \frac{1}{3}x - 2$ c) $y = -x$

d) $2x + 3y = -12$ e) $x = 5$ f) $y = -5$

84. Complete each ordered-pair solution of the given equations.

a) $y = 5x + 1;\ (0,\ ),(-1,\ ),(\ ,11)$ b.) $x - y = -3;\ (\ ,0),(0,\ ),(4,\ )$

**GEOMETRY**

85. Find the perimeter and area of *figure 1*.
Give correct units.

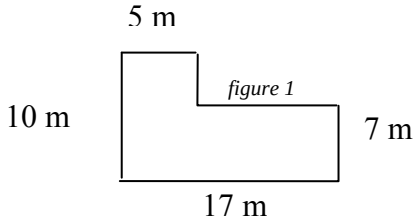


*figure 1*

86. Find the perimeter and area of *figure 2*
Give correct units.

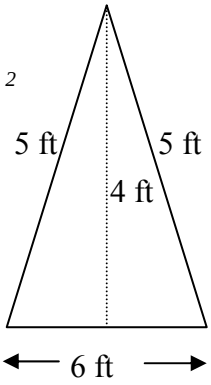


*figure 2*

87. Find the circumference and area of *figure 3*.
Use $\pi = 3.14$. Give correct units.

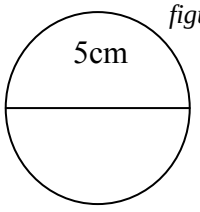
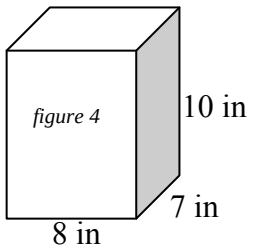


*figure 3*

88. Find the volume of the *figure 4.*
Give correct units.




**Polynomials**

Perform the operations and simplify.

89. $(5x^2 - x + 7) + (3x^2 - x - 4)$ 90. $(5x^2 - x + 7) - (3x^2 - x - 4)$ 91. $(3x - 1)(2x + 1)$

92. $(t - 3)^2$ 93. $-5x^3 + 7x^3$ 94. $(7a^5b^2)(2a^8b^4)$

95. Evaluate the polynomial $4x^2 - 5x + 1$ for $x = -3$.

**ANSWERS – MA 090 FINAL EXAM REVIEW**

1. a) 5300 b) 5280 c) 5282 d) 5281.8 e) 5281.785 2. a) 19,800 b) 19,850 c) 19,846 d) 19,845.7

e) 19,845.660 3. 11 4. 117 5. 47 6. –32 7. 6 8. –4 9. –8.92 10. –6.35 11. –88.163

12. –26.69 13. 9.51 14. –3.5 15. -15.4 16. -3.7 17. -47.25 18. > 19. < 20. = 21. <

22. > 23. = 24. < 25. > 26. = 27. a) -14.8, -14.7, $-\frac{29}{2}$ b) 0.375, $\frac{19}{48}$, $\frac{5}{12}$ c) $1\frac{1}{2}$, 153%, 1.6

28. $-3a - 4t$ 29. $-13x + 6$ 30. $-4x + 27$ 31. $-5x + 12.5y + 10$ 32. 3.8x

33. 11x – 8 34. x 35. $6.6a + b - 7.4$ 36. a) 1.9375 b) $-\frac{1}{2}$ or -0.5 37. a) 3.25 b) 7 38. $-\frac{1}{4}$ 39. $\frac{13}{30}$

40. $\frac{7}{10}$ 41. $\frac{19}{7}$ 42. –5 43. $-\frac{1}{5}$ 44. $-\frac{8}{27}$ 45. $\frac{5}{18}$ 46. $\frac{27}{500}$, 0.054 47. $\frac{9}{25}$, 36% 48. $\frac{17}{5}$, 340%

49. a) P = 1.5 mi, A = 0.125 $mi^2$ b) P = 60.6 cm, A = 218.3 $cm^2$ 50. –2 51. –6 52. 3 53. –1

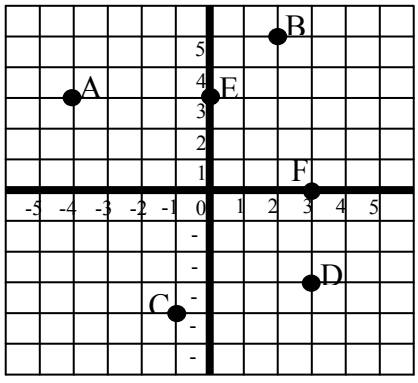
54. 9 55. –20 56. 12 57. 4 58. 4.2 59. 10 60. 0.45 61. 7 62. 5 63. 28 64. 38.4

65. –1 66. $5(x + 10) = 30;\ x = -4$ 67. $5x + 10 = 30;\ x = 4$ 68. $12 - 8x = -12;\ x = 3$ 69. $\frac{x}{8} = -12;\ x = -96$

70. $1.25 per box 71. 26.7 gal 72. 66 g 73. 20% 74. 25 75. 200

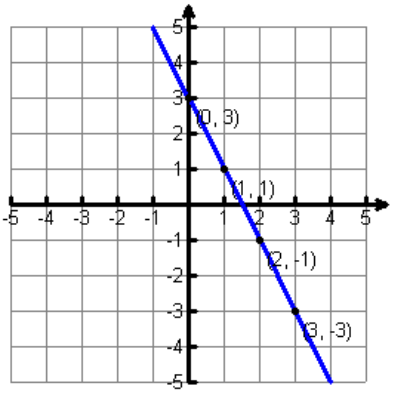
76. 84 multiple choice questions 77. $10,500 78. 6.3% 79. $73,248 80. a) 3.5% b) $\frac{3}{10}$ c) 75%

81. A quadrant II
B quadrant I
C quadrant III
D quadrant IV
E-on y-axis
F-on the x-axis

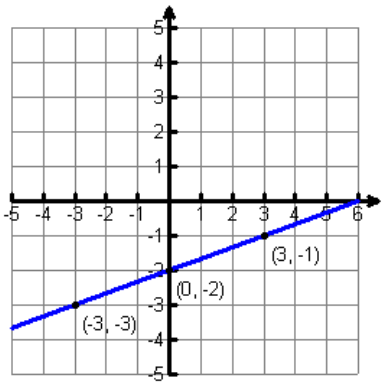


82. A(−3,−2), B(0,−4), C(2,0), D(4,2), E(−3,5)

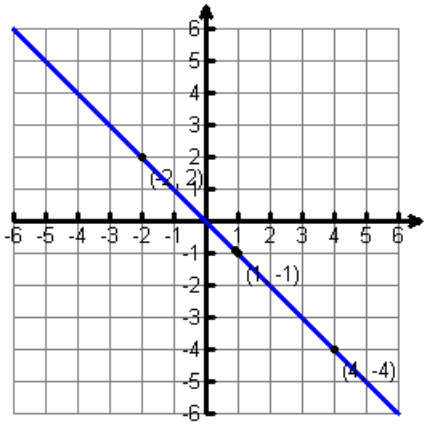
83. a)



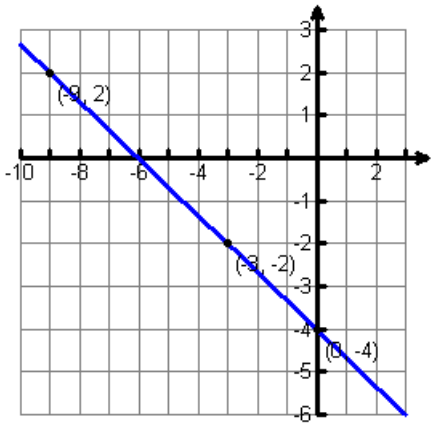

b)



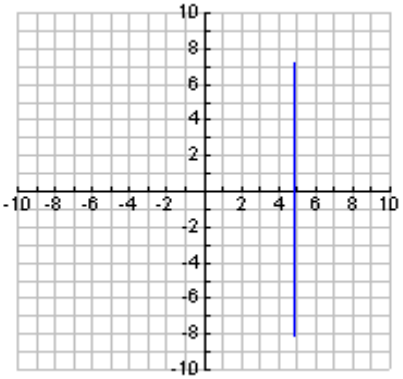

c)



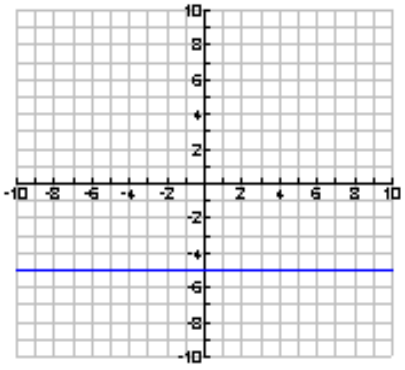

d)




**(e)**



**(f)**



84. a) $(0,1),(-1,-4),(2,11)$ b) $(-3,0),(0,3),(4,7)$ 85. $P = 54m$ $A = 134m^2$ 86. P = 16 ft A = 12 ft$^2$

87. C = 15.7 cm; A = 19.625 cm$^2$ 88. 560 in$^3$ 89. $8x^2 - 2x + 3$ 90. $2x^2 + 11$ 91. $6x^2 + x - 1$

92. $t^2 - 6t + 9$ 93. $2x^3$ 94. $14a^{13}b^6$ 95. 52