Summer Packet for Discrete Math

See the last page for the rubric!

Name_____

List all the elements of B that belong to the specified set.

1) $B = \left\{18, \sqrt{8}, -14, 0, \frac{1}{4}, -4, 5.0, \sqrt{16}\right\}$ 1) _____

Whole numbers

Perform the indicated operation.

2) $-22 + (-3)$ 2) _____

3) $15 + (-10) - 5 - (-7)$ 3) _____

4) $(-8)(5)(-6)$ 4) _____

Perform the indicated operations.

5) $\dfrac{5(2+1) - 7(1+1)}{5(4-2) - 2^3}$ 5) _____

Evaluate the expression.

6) $-[-(-4)]^4$ 6) _____

Write the fraction in lowest terms.

7) $-\dfrac{22}{74}$ 7) _____

If the number given is a mixed number, convert it to a fraction. If the number is given as a fraction, convert it to a mixed number.

8) $25\frac{1}{9}$ 8) _____

9) $\dfrac{82}{25}$ 9) _____

Perform the operation and give the answer as a fraction in lowest terms.

10) $\left(\frac{2}{3}\right) - \left(-\frac{8}{19}\right)$ 10) _____

11) $\left(-\frac{1}{3}\right)\left(-\frac{9}{14}\right)$ 11) _____

12) $\left(\frac{1}{7}\right) \div \left(\frac{4}{7}\right)$ 12) _____

Perform the operation and reduce the answer to lowest terms.

13) $29\frac{1}{3} - 10\frac{1}{3}$ 13) _____

14) $4\frac{1}{5} \div 4\frac{3}{5}$ 14) _____

Simplify the complex fraction.

15) $\dfrac{\frac{1}{3} - \frac{1}{6}}{\frac{1}{3} + \frac{1}{4}}$ 15) _____

Decide if the number is rational or irrational.

16) $\frac{5}{11}$ 16) _____

Find the square root correct to the thousandths place.

17) $\sqrt{129}$ 17) _____

Simplify and evaluate using a calculator.

18) $\sqrt{\frac{49}{36}}$ 18) _____

Perform the indicated operations.

19) $3\sqrt{18} + 3\sqrt{32}$ 19) _____

Perform the operation.

20) $-1.2 \div 0.02$ 20) _____

Round the number to the nearest thousandth, nearest hundredth, and nearest tenth. Remember to round from the original number.

21) 974.725 21) _____

Write as a percent.

22) 0.867 22) _____

23) $\frac{21}{10}$ 23) _____

Solve the problem. Round to the nearest hundredth.

24) 42% of what number is 65? 24) _____

Write as a real number or a product of a real number and i.

25) $\sqrt{-196}$ 25) _____

26) $\sqrt{-19} \cdot \sqrt{-19}$ 26) _____

27) $\dfrac{\sqrt{-54}}{\sqrt{-6}}$ 27) _____

28) $\dfrac{\sqrt{-12} \cdot \sqrt{-4}}{\sqrt{3}}$ 28) _____

Solve the equation.

29) $7n - 3 = 53$ 29) _____

30) $10y = 2y + 4 + 7y$ 30) _____

31) $5x + 6 - 3(x + 1) = 4x - 6$ 31) _____

32) $(y - 4) - (y + 4) = 7y$ 32) _____

33) $14(7c - 3) = 8c - 2$ 33) _____

34) $\dfrac{p}{3} - \dfrac{3p}{8} = 2$ 34) _____

35) $\dfrac{(r + 6)}{3} = \dfrac{(r + 8)}{6}$ 35) _____

36) $\dfrac{-2x + 9}{2} + 3 = -\dfrac{7x}{4}$ 36) _____

37) $-0.01x + 0.13(x + 9000) = 1530$ 37) _____

38) $-0.06y + 0.12(7000 - y) = 0.07y$ 38) _____

39) $\dfrac{x}{22} = \dfrac{4}{11}$ 39) _____

40) $\dfrac{5}{y} = \dfrac{15}{9}$ 40) _____

41) $\dfrac{5x + 2}{12} = \dfrac{3x - 6}{8}$ 41) _____

Determine the ratio and write it in lowest terms.

42) 18 people to 6 people 42) _____

43) 3 yards to 5 feet 43) _____

Evaluate the expression.

44) -7^3 44) _____

45) $(-6)^4$ 45) _____

46) $-(-4)^3$ 46) _____

47) 2^{-4} 47) _____

48) -3^{-2} 48) _____

49) $(-2)^{-1}$ 49) _____

50) $\frac{5^{-2}}{7^{-4}}$ 50) _____

51) $\left(-\frac{3}{4}\right)^{-3}$ 51) _____

52) $6^{-1} + 5^{-1}$ 52) _____

53) $6^4 + 6^1$ 53) _____

54) $(-7)^4 - (-5)^4$ 54) _____

55) $2^3 + 2^4$ 55) _____

Evaluate.

56) 8^0 56) _____

57) -3^0 57) _____

58) $(-6)^0$ 58) _____

Use a combination of rules for exponents to simplify. Write answers with only positive exponents. Assume that all variables represent nonzero real numbers.

59) $(2x^{-5})^2(x^2)^{-4}$ 59) _____

60) $(-4p)^6(-4p)^2$ 60) _____

61) $\dfrac{(x^4y^{-3})^2}{x^{-4}y^2}$ 61) _____

Express the number in scientific notation.

62) 1278 62) _____

63) 67 63) _____

64) 761.307 64) _____

65) .000092018 65) _____

66) .0000050916 66) _____

67) .00000086507 67) _____

Write the number in standard notation.

68) 2.28×10^3 68) _____

69) 7.336×10^4 69) _____

70) 1.7699×10^4 70) _____

71) 8.66×10^{-4} 71) _____

72) 3.317×10^{-5} 72) _____

73) 1.748×10^{-6} 73) _____

Perform the indicated operation.

74) $(5x^2 - x - 6) + (-2x^2 - 4x + 3)$ 74) _____

75) $(-6x^3 + 9x^2 + 4) - (-5x^3 + 2x - 5)$ 75) _____

76) $(6 + x^2 - 2x) + (-4x + 12 + x^3) + (-3x - 8 + 2x^3)$ 76) _____

77) $3(4x^2 + 2x - 7) - 4(2x^2 - 5x + 3)$ 77) _____

78) $(-3x^5 + 4x^7 - 9) + (4x^6 + 2) - (-2x^6 + 6x^7 - 7x^5)$ 78) _____

Find the product.

79) $(x + 7)(x - 11)$ 79) _____

80) $(5x + 7)(x + 5)$ 80) _____

81) $(-5x + 9)(2x - 11)$ 81) _____

82) $(2a - 1)^2$ 82) _____

83) $(5x - 11y^2)^2$ 83) _____

84) $(5y - 7)(25y^2 + 35y + 49)$ 84) _____

Factor out the greatest common factor. Simplify the factors, if possible.

85) $2x^3 + 6x$ 85) _____

86) $4t^2 - 12t - 12$ 86) _____

87) $20wx - 8wy - 20wz$ 87) _____

88) $16m^8 + 20m^6 + 20m^2$ 88) _____

89) $72m^9 + 64m^5 + 16m^2$ 89) _____

90) $42x^9y^9 + 24x^3y^5 - 54x^5y^2$ 90) _____

91) $3x(5x - 2) - 5(5x - 2)$ 91) _____

92) $5m(7 - m) + 9n(7 - m)$ 92) _____

Factor by grouping.

93) $20x^2 - 25xy + 8xy - 10y^2$ 93) _____

94) $15x^2 + 6x + 20x + 8$ 94) _____

95) $12 - 6r - 2p + rp$ 95) _____

Factor the trinomial completely.

96) $x^2 - x - 20$ 96) _____

97) $x^2 + 7x - 44$ 97) _____

98) $15x^2 + 29x + 12$ 98) _____

99) $15z^2 - 11z - 12$ 99) _____

100) $3x^2 - 24x + 48$ 100) _____

Factor completely.

101) $x^2 + 3xy - 18y^2$ 101) _____

102) $u^2 - 2uv - 8v^2$ 102) _____

103) $10z^2 - 7zy - 12y^2$ 103) _____

104) $3x^2 - 21xy + 36y^2$ 104) _____

105) $9x^2 - 27xy - 36y^2$ 105) _____

106) $x^3y + 2x^2y^2 - 35xy^3$ 106) _____

107) $x^2 + 32x + 256$ 107) _____

108) $r^2 - 10r + 25$ 108) _____

109) $25p^2 - 70p + 49$ 109) _____

110) $y^2 - 4$ 110) _____

111) $81x^2 - 4$ 111) _____

112) $4k^2 - 9m^2$ 112) _____

Solve the equation by the zero-factor property.

113) $x(5x + 25) = 0$ 113) _____

114) $(x - 6)(x + 7) = 0$ 114) _____

115) $(3x - 8)(x + 1) = 0$ 115) _____

Solve the equation.

116) $y^2 = 10$ 116) _____

117) $x^2 = 144$ 117) _____

118) $x^2 + 3 = 147$ 118) _____

119) $4z^2 + 2 = 786$ 119) _____

120) $-6k^2 - 5 = -155$ 120) _____

121) $x^2 + 3 = 103$ 121) _____

Solve the equation by using the quadratic formula. Give only real number solutions.

122) $p^2 + 3p - 9 = 0$ 122) _____

123) $4n^2 = -12n - 3$ 123) _____

Solve by the elimination method.

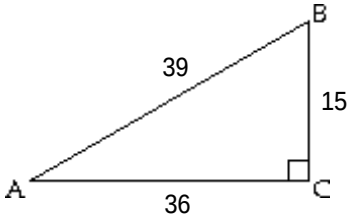
124) $x + 6y = 17$ 124) _____
$3x + 5y = 25$

Solve by the substitution method.

125) $x - 4y = 20$ 125) _____
$9x - 3y = 15$

Find the exact values of the indicated trigonometric functions. Write fractions in lowest terms.

126) 126) _____



Find tan A and cot A.

Find a value of θ such that $0 \le \theta \le 90°$ and θ satisfies the statement.

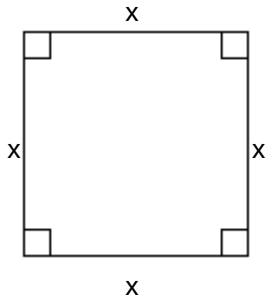
127) $\cos \theta = 0.7649$ 127) _____

Solve the triangle.

128) $b = 19$, $c = 29$, $A = 82°$ 128) _____

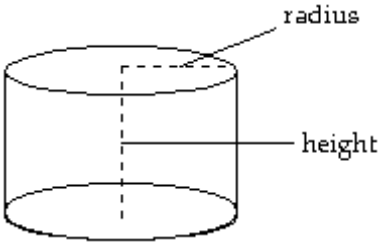
The following figure has perimeter, circumference, or area as indicated. Find the value of x. Use 3.14 as an approximation for π.

129) A = 57.76 129) _____



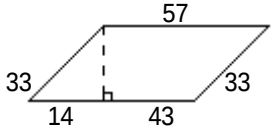
Find the surface area of the circular solid. Unless otherwise specified, use 3.14 for π and round your answer to the nearest tenth.

130) A right circular cylinder with r = 4 cm, h = 5 cm 130) _____



Solve the problem.

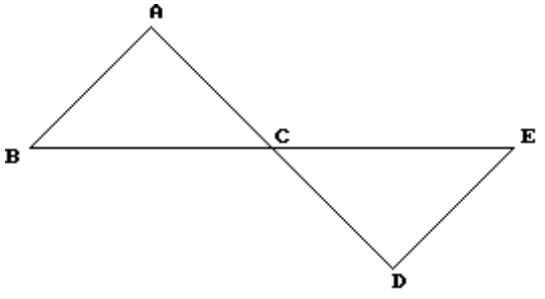
131) 131) _____



Find the area.

Give the measure of the missing angle using the similar triangles below.

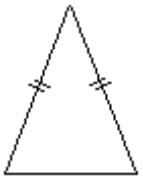
132) $\angle B$ 132) _____



$\triangle ABC \sim \triangle DEC$, $\overline{AC} = 7$ cm, $\angle E = 59°$

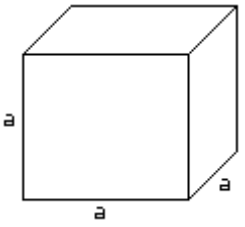
Classify the triangle as acute, right, or obtuse and as equilateral, isosceles, or scalene.

133) 133) _____



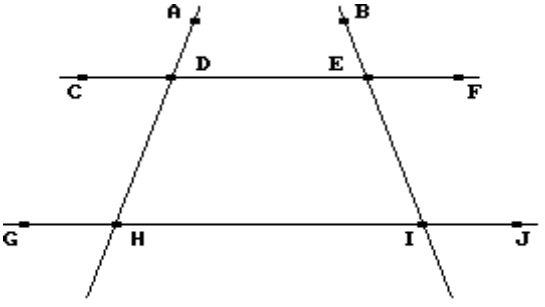
Find the total surface area of the given space figure.

134) 134) _____



a = 5 ft

Refer to this figure to answer the question. Assume $\overleftrightarrow{CF}$ and $\overleftrightarrow{GJ}$ are parallel.



135) Are ∠DEB and ∠BEF vertical angles? 135) _____

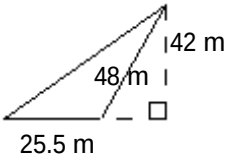
136) Are ∠CDA and ∠GHD equal in measure? 136) _____

137) What is the vertex of ∠DEI? 137) _____

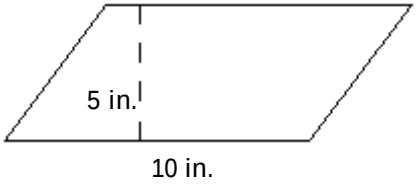
138) Are ∠DEB and ∠BEF adjacent angles? 138) _____

Find the area.

139) 139) _____

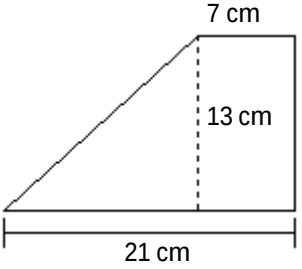


140) 140) _____



(a parallelogram)

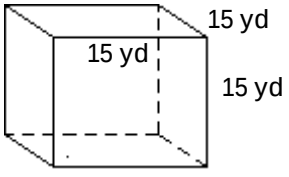
141) 141) _____



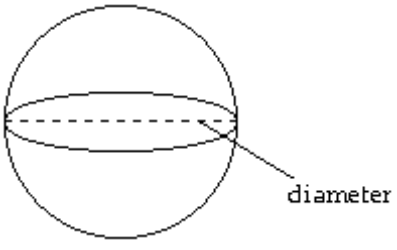
(a trapezoid)

Find the volume.

142) 142) _____



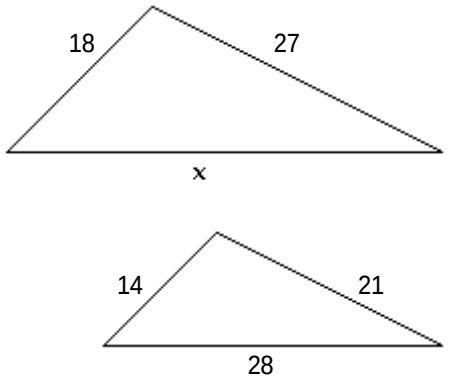
143) Find the volume of the given sphere. Use 3.14 for π. Round your answer to the nearest thousandth. 143) _____



diameter = 3.4 cm

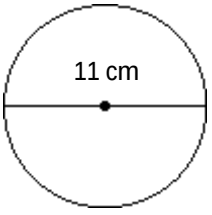
The two triangles below are similar. Find the unknown side lengths.

144) 144) _____

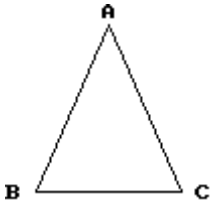


Find the area of the circle. Use 3.14 for π. Round results to two decimal places in necessary

145) 145) _____



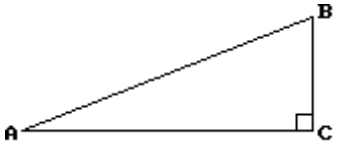
Refer to the given figure, an isosceles triangle with AB = AC.



146) If $\angle A$ measures 134° find the measure of $\angle B$. 146) _____

Find the measure of each unknown angle in triangle ABC.

147) 147) _____



$\angle A = (45 - x)°$, $\angle B = (9x - 35)°$

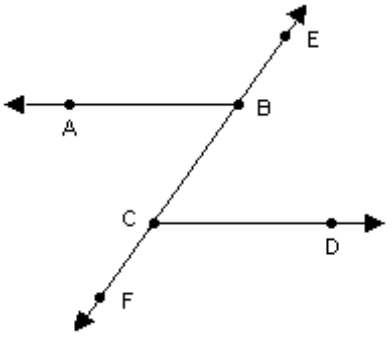
Find the area of the shaded region in the figure. Round results to the nearest unit.

148) A small circular pool is enclosed in a square. Find the area inside the square but outside the circle. 148) _____

3.3 m

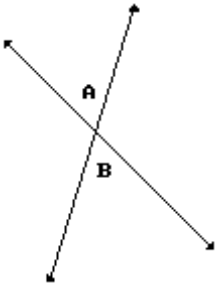
Use the properties of parallel lines to solve the problem.

149) In the figure, $\overline{AB} \parallel \overline{CD}$. $m\angle ABC = 68°$. Find the measures of angles $\angle ABE$, $\angle FCD$, and $\angle BCD$. 149) _____



Find the measure of the angles.

150) 150) _____



$\angle A = (7x - 57)°$, $\angle B = (5x - 25)°$

PCTI Mathematics Department
Sal F. Gambino, *Supervisor*
Summer Packet Grading

- On the first day of school, the teacher will check for completion/effort of the packet.
- **This will be weighted at 50%.**
- Teacher will then review the packet with the students.
- Upon completion of the review, the students will be given an assessment based on the summer packet.
- **The assessment will be weighted at 50%.**
- **The two weighted scores combined will count as one project grade**.
- Therefore, the grade for the summer packet will be placed under the "project" category.