

1st Score: _____	2nd Score: _____	3rd Score: _____	_____. ____ <b>Final Score</b>
S & G _____	S & G _____	S & G _____	
Grader: _____	Grader: _____	Grader: _____	

## PLACE LABEL BELOW

Name: \_\_\_\_\_ School: \_\_\_\_\_

SS/ID Number: \_\_\_\_\_ City: \_\_\_\_\_

Grade:    4    5    6    7    8                      Classification:    1A    2A    3A    4A    5A    6A



## TMSCA MIDDLE SCHOOL CALCULATOR GEAR-UP TEST ©

2018 - 2019

### GENERAL DIRECTIONS

**I. About this test:**

- A. You will be given 30 minutes to take this test. There are 80 problems on this test.
- B. ALL calculators must be cleared. TI-Nspire and HP Prime calculators are NOT permitted.**

**II. How to write the answers:**

- A. For all problems except stated problem as noted below write three significant digits.
  1. Examples (\* means correct, but not recommended)  
 Correct: 12.3, 123, 123.\*, 1.23x10\*, 1.23x10<sup>0</sup>\*, 1.23x10<sup>1</sup>, 1.23x10<sup>01</sup>, .0190, 1.90x10<sup>-2</sup>  
 Incorrect: 12.30, 123.0, 1.23(10)<sup>2</sup>, 1.23·10<sup>2</sup>, 1.230x10<sup>2</sup>, 1.23\*10<sup>2</sup>, 0.19, 1.9x10<sup>-2</sup>, 19.0x10<sup>-3</sup>, 1.90E-02
  2. Plus or minus one digit error in the third significant digit is permitted.
- B. For stated problems:

1. Except for integer, dollar sign, and significant digit problems, as detailed below, answers to stated problems should be written with three significant digits.
2. Integer problems are indicated by (integer) in the answer blank. Integer problems answers must be exact, no plus or minus one digit, no decimal point or scientific notation.
3. Dollar sign (\$) problems should be answered to the exact cent, but plus or minus one cent error is permitted. The decimal point and cents are required for exact dollar answers.

**III. Some symbols used on the test.**

- A. Angle measure: rad means radians; deg means degrees.
- B. Inverse trigonometric functions: arcsin for inverse sine, etc.
- C. Special numbers:  $\pi$  for 3.14159 . . . ; e for 2.71828.
- D. Logarithms: Log means common (base 10); Ln means natural (base e).

**IV. Scoring:**

- A. All problems answered correctly are worth FIVE points. FOUR points will be deducted for all problems answered incorrectly or skipped before the last problem attempted.

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## 2018-2019 TMSCA Middle School Calculator Gear-Up On-Line Meet

1.  $2350 - 2700$  ----- 1=\_\_\_\_\_
2.  $19 + 26 + 5$  ----- 2=\_\_\_\_\_
3.  $-686 + 2850 + 4300$  ----- 3=\_\_\_\_\_
4.  $23 - \pi - 21 + 19$  ----- 4=\_\_\_\_\_
5.  $128 - 266 - 596 - 509$  ----- 5=\_\_\_\_\_
6.  $195 - 149 - 184 + 164 + 136$  ----- 6=\_\_\_\_\_
7.  $1.33 + 1.39 + 1.82 + 1.44 + 0.928$  ----- 7=\_\_\_\_\_
8.  $(0.986 + 0.299 - \pi) - (0.389 + 1.38)$  ----- 8=\_\_\_\_\_
9.  $42.2 \times 244 \times 121$  ----- 9=\_\_\_\_\_
10.  $505 \times 5100 \times 4680 \times 4640$  -----10=\_\_\_\_\_
11. Calculate the quotient of 1267 and 41. -----11=\_\_\_\_\_
12. At the local donut shop, the prices for donuts are 98¢ for old fashioned, 95¢ for glazed or chocolate, and \$1.29 for fancy. If you buy a dozen or more, you receive a 10% discount. Jerry wanted 10 glazed, 10 chocolate, 8 fancy, and 8 old fashioned. Calculate the cost of the donuts. -----12=\$\_\_\_\_\_
13. Calculate the number of degrees in  $7\pi/4$  radians. -----13=\_\_\_\_\_°

14.  $(110)[127 \times 224 \times 240]$  -----14=\_\_\_\_\_

15.  $(39)[151 \times 212/50]$  -----15=\_\_\_\_\_

16.  $(-141 + 420)[470 - 488 - 455]$  -----16=\_\_\_\_\_

17.  $\left[\frac{415}{379}\right] [(512/163) + 1.36]$  -----17=\_\_\_\_\_

18.  $\left[\frac{102/88}{195/149}\right] \{0.0783 + 0.0701 - 0.0577\}$  -----18=\_\_\_\_\_

19.  $\left[\frac{(987/635) - (1030/739)}{2.91/(\pi)}\right]$  -----19=\_\_\_\_\_

20.  $\frac{25.3 + 52.9 + 43}{(2.06 \times 10^{-4})(235)(290)}$  -----20=\_\_\_\_\_

21.  $\frac{201}{(98 - 212)} - \frac{(191 - 185)}{179}$  -----21=\_\_\_\_\_

22.  $\frac{(3.62 + 1.51 - 3.22)}{\{(1300 - 360)/(29.1)\}}$  -----22=\_\_\_\_\_

23.  $\frac{(\pi)(455/451)(325/64)}{(92/552)}$  -----23=\_\_\_\_\_

24. Doug and his wife purchased a used car. They make a down payment of \$1,200 and will be making payments for 5 years. Their payments are 319.56 per month. Calculate the total they paid for their vehicle. -----24=\$\_\_\_\_\_

25. Vincent went on a trip to Japan. He exchanged \$500 into Japanese Yen. The exchange rate is \$1 to 109.50393 Yen. Calculate how many Yen he received for his \$500. -----25=\_\_\_\_\_ ¥

26. Calculate the measure of an interior angle of a regular octagon in degrees. -----26=\_\_\_\_\_

27.  $\frac{(0.0057 - 0.00484)(0.444 + 0.148)}{(2.07 \times 10^{11})}$  -----27=\_\_\_\_\_

28.  $\frac{(1.63 + 1.34)(31.6 + 98.8)}{(4.29 \times 10^{11})}$  -----28=\_\_\_\_\_

29.  $\frac{(2.60 \times 10^5) + (1.51 \times 10^6)}{(-0.249)(0.0658) - 0.00502}$  -----29=\_\_\_\_\_

30.  $(5.74) \left[ \frac{60.7}{(2.72 \times 10^{11})} \right]$  -----30=\_\_\_\_\_

31.  $\frac{1}{-0.00387} + \frac{1}{(0.0302 - 0.0347)}$  -----31=\_\_\_\_\_

32.  $(8.81) \left[ (5.20 \times 10^{10}) - (4.68 \times 10^{10}) \right]$  -----32=\_\_\_\_\_

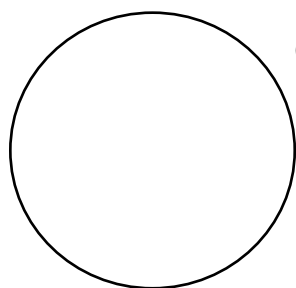
33.  $\frac{1}{4490} - \frac{1}{1230} + \frac{1}{1080}$  -----33=\_\_\_\_\_

34.  $1/(0.011 - 0.0414) - 1/(-0.0124)$  -----34=\_\_\_\_\_

35. Calculate the value of 52135 Base 6 in Base 10. -----35=\_\_\_\_\_INT.

36. A cube has a volume of 267 cubic inches. Calculate the new volume if the length of a side is cut in half. -----36=\_\_\_\_\_in.<sup>3</sup>

CIRCLE

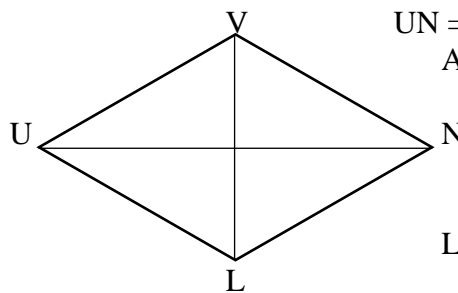


Circumference = 92104

Area = ?

37=\_\_\_\_\_

RHOMBUS

UN = 229.71  
Area = 21741

LV = ?

38=\_\_\_\_\_

39.  $(2.77 + 2.36)^2(0.056 + 0.0186)^2$  -----39=\_\_\_\_\_

40.  $\sqrt{\frac{3300 + 5410}{493 - 407}}$  -----40=\_\_\_\_\_

41.  $\left[ \frac{1170 + (1/(8.95 \times 10^{-4}))}{(356/2080) - 0.126} \right]^2$  -----41=\_\_\_\_\_

42.  $\sqrt{(128/59.6) + 1.88 - 1.2}$  -----42=\_\_\_\_\_

43.  $(1/\pi) \sqrt[3]{\frac{0.0479 + 0.144}{0.158 - 0.151}}$  -----43=\_\_\_\_\_

44.  $(1/(9.38 \times 10^{-4}))(21600 - 5670)^2$  -----44=\_\_\_\_\_

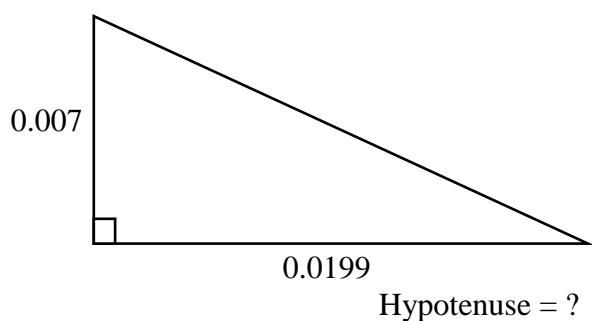
45.  $\frac{1}{\sqrt{6930 + 5770 + 4490}} + \left( \frac{1}{\sqrt{17.5}} \right)^2$  -----45=\_\_\_\_\_

46.  $(684) \sqrt[4]{1660 + 5580 - 3650}$  -----46=\_\_\_\_\_

47. The cost of an item went from \$129.35 to \$99.18. Calculate the percent change in cost. -----47=\_\_\_\_\_%

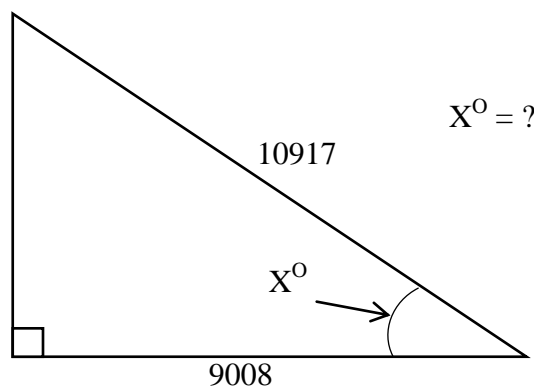
48. Calculate pi to the tenth power plus 10 the power of pi. -----48=\_\_\_\_\_

RIGHT TRIANGLE



49=\_\_\_\_\_

RIGHT TRIANGLE



50=\_\_\_\_\_

$$51. \quad \frac{\sqrt{4.61 + \pi + 5.16}}{(7260 - 12300 + 16700)^3} \text{ -----} 51 = \underline{\hspace{2cm}}$$

$$52. \quad \left[ \frac{704 - 675 + \sqrt{56500/93}}{-71.9 + 88} \right]^2 \text{ -----} 52 = \underline{\hspace{2cm}}$$

$$53. \quad \sqrt{\frac{3.83 \times 10^{14}}{(758)(98000)}} + \frac{(3580 - 3800)}{(0.0316 + 0.018)} \text{ -----} 53 = \underline{\hspace{2cm}}$$

$$54. \quad (937)^2 \sqrt{(40.3)/(136)} - (85800 + 1.18 \times 10^5) \text{ -----} 54 = \underline{\hspace{2cm}}$$

$$55. \quad 0.152 + \sqrt{(74.3)/(443)} - (0.366 + 0.427)^2 \text{ -----} 55 = \underline{\hspace{2cm}}$$

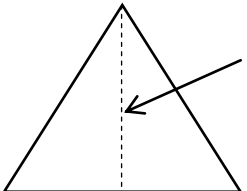
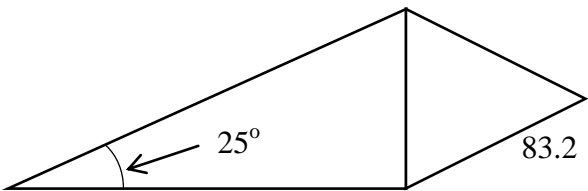
$$56. \quad (500)(2.96 \times 10^{10})^{1/4} - [(91500)(2.73 \times 10^5)]^{1/2} \text{ -----} 56 = \underline{\hspace{2cm}}$$

$$57. \quad \sqrt{\frac{1/(2860 - 649)}{(5.86)(40 + 46.4)^{-3}}} \text{ -----} 57 = \underline{\hspace{2cm}}$$

$$58. \quad \sqrt{\frac{(5.02)(8.99)}{(682) + (241)}} + 1/(0.47)^{-2} \text{ -----} 58 = \underline{\hspace{2cm}}$$

59. Victoria can paddle her canoe 10 miles downstream in 45 minutes. She makes the return trip in 2 ½ hours. Calculate the speed of the stream in miles per hour. -----59=\_\_\_\_\_mph

60. Calculate the 51<sup>st</sup> pentagonal number. -----60=\_\_\_\_\_INT.

<p style="text-align: center;"><b>EQUILATERAL TRIANGLE</b></p> <div style="text-align: center;">  <p>Height = 0.000571</p> </div> <p style="text-align: right;">Area = ?</p> <p>61=_____</p>	<p style="text-align: center;"><b>EQUILATERAL AND RIGHT TRIANGLE</b></p> <div style="text-align: center;">  <p>25°      83.2</p> </div> <p style="text-align: right;">Area = ?</p> <p>62=_____</p>
---	--

63.  $\frac{6! + 4!}{8!}$  -----63=\_\_\_\_\_

64. (deg)  $\frac{\tan(9.14^\circ)}{2180}$  -----64=\_\_\_\_\_

65. (deg)  $(95.2 + 47.1)\cos(39.3^\circ)$  -----65=\_\_\_\_\_

66. (deg)  $[54.2]\cos(71.2^\circ - 63.8^\circ)$  -----66=\_\_\_\_\_

67. (rad)  $\cos\left[\frac{(184)(\pi)}{(56.9)(1.15)}\right]$  -----67=\_\_\_\_\_

68. (deg)  $\frac{\sin(3.18^\circ) - \tan(3.18^\circ)}{\sin(3.18^\circ)}$  -----68=\_\_\_\_\_

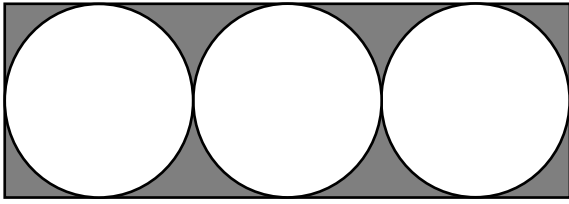
69. (rad)  $\tan[(2.34 - 2.07)(13.5)]$  -----69=\_\_\_\_\_

70.  $(559 - 365)e^{\pi - 0.785}$  -----70=\_\_\_\_\_

71. Calculate the probability of rolling a double on a pair of dice. -----71=\_\_\_\_\_

72. Right triangles STV and RSM are similar. The length of each side of triangle STV is 5.5 times the length of each corresponding side of triangle RSM. Calculate how many times greater the area of triangle STV is than triangle RSM. -----72=\_\_\_\_\_

## RECTANGLE AND CONGRUENT CIRCLES

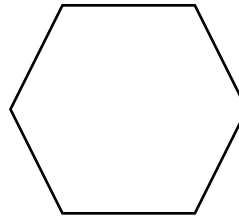


Radius of Circle = 191

Shaded Area = ?

73=\_\_\_\_\_

## REGULAR HEXAGON



Area = 41.569

Side = ?

74=\_\_\_\_\_

$$75. \quad \ln \left[ \frac{53 + 92.2 + 70.2}{277 + 450 - 139} \right] \text{ ----- } 75 = \underline{\hspace{2cm}}$$

$$76. \quad \frac{(3.85)^{0.116}(1.93)^{0.857}}{(1.14 - 0.496)^{-5}} \text{ ----- } 76 = \underline{\hspace{2cm}}$$

$$77. \quad \text{Log}(15.2 + 2.77 + 10.8) \text{ ----- } 77 = \underline{\hspace{2cm}}$$

$$78. \quad \frac{\text{Log}[15700 + (656)(27.1)]}{1.53 + \text{Log}[3440 + 3080]} \text{ ----- } 78 = \underline{\hspace{2cm}}$$

$$79. \quad 2 + 4 + 6 + \dots + 344 \text{ ----- } 79 = \underline{\hspace{2cm}}$$

$$80. \quad (0.189) - \frac{(0.189)^2}{2} + \frac{(0.189)^3}{3} - \frac{(0.189)^4}{4} \text{ ----- } 80 = \underline{\hspace{2cm}}$$



# 2018-2019 TMSCA Middle School Calculator Gear-Up On-Line Meet Answer Key

Page 1	Page 2	Page 3	Page 4
1 = -350 = $-3.50 \times 10^2$	14 = $7.51 \times 10^8$	27 = $2.46 \times 10^{-15}$	39 = 0.146 = $1.46 \times 10^{-1}$
2 = 50.0 = $5.00 \times 10^1$	15 = 25000 = $2.50 \times 10^4$	28 = $9.03 \times 10^{-10}$	40 = 10.1 = $1.01 \times 10^1$
3 = 6460 = $6.46 \times 10^3$	16 = -132000 = $-1.32 \times 10^5$	29 = $-8.27 \times 10^7$	41 = $2.57 \times 10^9$
4 = 17.9 = $1.79 \times 10^1$	17 = 4.93 = $4.93 \times 10^0$	30 = $1.28 \times 10^{-9}$	42 = 1.68 = $1.68 \times 10^0$
5 = -1240 = $-1.24 \times 10^3$	18 = 0.0803 = $8.03 \times 10^{-2}$	31 = -481 = $-4.81 \times 10^2$	43 = 0.960 = $9.60 \times 10^{-1}$
6 = 162 = $1.62 \times 10^2$	19 = 0.173 = $1.73 \times 10^{-1}$	32 = $4.58 \times 10^{10}$	44 = $2.71 \times 10^{11}$
7 = 6.91 = $6.91 \times 10^0$	20 = 8.63 = $8.63 \times 10^0$	33 = 0.000336 = $3.36 \times 10^{-4}$	45 = 0.0648 = $6.48 \times 10^{-2}$
8 = -3.63 = $-3.63 \times 10^0$	21 = -1.80 = $-1.80 \times 10^0$	34 = 47.8 = $4.78 \times 10^1$	46 = 5290 = $5.29 \times 10^3$
9 = $1.25 \times 10^6$	22 = 0.0591 = $5.91 \times 10^{-2}$	35 = 6971 INT.	47 = -23.3 = $-2.33 \times 10^1$
10 = $5.59 \times 10^{13}$	23 = 96.6 = $9.66 \times 10^1$	36 = 33.4 = $3.34 \times 10^1$	48 = 95000 = $9.50 \times 10^4$
11 = 30.9 = $3.09 \times 10^1$	24 = \$20373.60	37 = $6.75 \times 10^8$	49 = 0.0211 = $2.11 \times 10^{-2}$
12 = \$33.44	25 = 54800 = $5.48 \times 10^4$	38 = 189 = $1.89 \times 10^2$	50 = 34.4 = $3.44 \times 10^1$
13 = 315 = $3.15 \times 10^2$	26 = 135 = $1.35 \times 10^2$		

# 2018-2019 TMSCA Middle School Calculator Gear-Up On-Line Meet Answer Key

## Page 5

$$51 = 2.27 \times 10^{-12}$$

$$52 = 11.1 \\ = 1.11 \times 10^1$$

$$53 = -2160 \\ = -2.16 \times 10^3$$

$$54 = 274000 \\ = 2.74 \times 10^5$$

$$55 = -0.0673 \\ = -6.73 \times 10^{-2}$$

$$56 = 49300 \\ = 4.93 \times 10^4$$

$$57 = 7.06 \\ = 7.06 \times 10^0$$

$$58 = 0.442 \\ = 4.42 \times 10^{-1}$$

$$59 = 4.67 \\ = 4.67 \times 10^0$$

$$60 = 3876 \text{ INT.}$$

## Page 6

$$61 = 1.88 \times 10^{-7}$$

$$62 = 10400 \\ = 1.04 \times 10^4$$

$$63 = 0.0185 \\ = 1.85 \times 10^{-2}$$

$$64 = 7.38 \times 10^{-5}$$

$$65 = 110 \\ = 1.10 \times 10^2$$

$$66 = 53.7 \\ = 5.37 \times 10^1$$

$$67 = -0.831 \\ = -8.31 \times 10^{-1}$$

$$68 = -0.00154 \\ = -1.54 \times 10^{-3}$$

$$69 = 0.551 \\ = 5.51 \times 10^{-1}$$

$$70 = 2050 \\ = 2.05 \times 10^3$$

$$71 = 0.167 \\ = 1.67 \times 10^{-1}$$

$$72 = 30.3 \\ = 3.03 \times 10^1$$

## Page 7

$$73 = 93900 \\ = 9.39 \times 10^4$$

$$74 = 4.00 \\ = 4.00 \times 10^0$$

$$75 = -1.00 \\ = -1.00 \times 10^0$$

$$76 = 0.228 \\ = 2.28 \times 10^{-1}$$

$$77 = 1.46 \\ = 1.46 \times 10^0$$

$$78 = 0.847 \\ = 8.47 \times 10^{-1}$$

$$79 = 29800 \\ = 2.98 \times 10^4$$

$$80 = 0.173 \\ = 1.73 \times 10^{-1}$$

TMSCA 18-19 MS CA Gear UP Test Solutions to Word and Geometry Problems

<p><b>11.</b> <math>\frac{1267}{41}</math></p> <p><b>12.</b> <math>[20(.95) + 8(1.29) + 8(.98)].9</math></p> <p><b>13.</b> Some calculators have a conversion key for this OR  <math>\frac{7}{4}(180)</math></p> <p><b>24.</b> <math>1200 + 319.56(12 \times 5)</math></p> <p><b>25.</b> <math>\\$500 \cdot \frac{109.50393}{\\$1}</math></p> <p><b>26.</b> <math>180 - \frac{360}{8}</math> OR <math>\frac{180(8-2)}{8}</math></p> <p><b>35.</b> <math>5(6^4) + 2(6^3) + 1(6^2) + 3(6) + 5</math></p> <p><b>36.</b> Volume is <math>\left(\frac{1}{2}\right)^3 = \frac{1}{8}</math> of the original. <math>\frac{267}{8}</math></p> <p><b>37.</b> <math>C = 2\pi r</math> <math>92104 = 2\pi r</math>  <math>r = \frac{92104}{2\pi}</math></p>	<p><b>38.</b> <math>A = \frac{(d_1)(d_2)}{2}</math>  <math>21741 = \frac{229.71d}{2}</math>  <math>d = \frac{2(21741)}{229.71}</math></p> <p><b>47.</b> On HP RPN calculator  129.35 enter; 99.18 %CHG  Otherwise: <math>\frac{99.18-129.35}{129.35}(100)</math></p> <p><b>48.</b> <math>\pi^{10} + 10^\pi</math></p> <p><b>49.</b> <math>\sqrt{.0199^2 + .007^2}</math></p> <p><b>50.</b> <math>\text{Acos}\left(\frac{9008}{10917}\right)</math></p> <p><b>59.</b> c = speed of canoe  w = speed of water (current)</p> <table border="1" data-bbox="581 1018 1044 1161"> <thead> <tr> <th></th><th>Rate</th><th>Time</th></tr> </thead> <tbody> <tr> <td>Downstream</td><td>c+w</td><td>.75</td></tr> <tr> <td>Upstream</td><td>c-w</td><td>2.5</td></tr> </tbody> </table> <p>Rate x time = distance  <math>\begin{cases} .75(c + w) = 10 \\ 2.5(c - w) = 10 \end{cases}</math>  <math>\begin{cases} c + w = 10 \div .75 \\ c - w = 10 \div 2.5 \end{cases}</math>  <math>\begin{cases} c + w = 10 \div .75 \\ -c + w = -10 \div 2.5 \end{cases}</math>  <math>2w = (10 \div .75) + (-10 \div 2.5)</math>  <math>w = \frac{(10 \div .75) + (-10 \div 2.5)}{2}</math></p> <p><b>60.</b> <math>\frac{n(3n-1)}{2} = \frac{51[51(3)-1]}{2}</math></p>		Rate	Time	Downstream	c+w	.75	Upstream	c-w	2.5	<p><b>61.</b> <math>A = \frac{h^2\sqrt{3}}{3} = \frac{.000571^2\sqrt{3}}{3}</math></p> <p><b>62.</b> Equilateral triangle:  <math>A = \frac{83.2^2\sqrt{3}}{4}</math></p> <p>Right triangle: <math>\tan 25 = \frac{83.2}{x}</math>  <math>x = \frac{83.2}{\tan 25}</math>  <math>A = \left[\left(\frac{83.2}{\tan 25}\right)83.2\right] \div 2</math></p> <p>Total area =  <math>\frac{83.2^2\sqrt{3}}{4} + \left[\left(\frac{83.2}{\tan 25}\right)83.2\right] \div 2</math></p> <p><b>71.</b> <math>\frac{6}{36}</math></p> <p><b>72.</b> <math>5.5^2</math></p> <p><b>73.</b> Rectangle minus 3 circles  <math>6(191)(2)(191) - 3\pi(191)^2</math></p> <p><b>74.</b> A hexagon consists of 6 equilateral triangles.  Area = <math>6\left(\frac{x^2\sqrt{3}}{4}\right) = 41.569</math>  <math>x = \sqrt{\frac{41.569(4)}{6\sqrt{3}}}</math></p>
	Rate	Time									
Downstream	c+w	.75									
Upstream	c-w	2.5									