

8 1st Score: _____	2nd Score: _____	3rd Score: _____	_____. ____ <b>Final Score</b>
S & G _____	S & G _____	S & G _____	
Grader: _____	Grader: _____	Grader: _____	

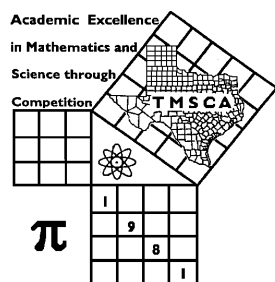
## PLACE LABEL BELOW

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

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

Grade: 5 6 7 8

Classification: 1A 2A 3A 4A 5A 6A



## TMSCA MIDDLE SCHOOL CALCULATOR

TEST #11 ©

FEBRUARY 11, 2017

### GENERAL DIRECTIONS

I. About this test:

- A. You will be given 30 minutes to take this test.
- B. There are 80 problems on this test.

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.

**2016-2017 TMSCA Middle School Calculator Test 11**

1.  $175 + 216$  ----- 1= \_\_\_\_\_

2.  $25 + 14 + 32$  ----- 2= \_\_\_\_\_

3.  $3840 + 2890 + 3790$  ----- 3= \_\_\_\_\_

4.  $16 + 19 + \pi + 26$  ----- 4= \_\_\_\_\_

5.  $-2370 - 2190 - 8340 - 5920$  ----- 5= \_\_\_\_\_

6.  $67.7 - 170 - 35.6 + 37.8 + 34.9$  ----- 6= \_\_\_\_\_

7.  $3.24 + 2.99 - \pi + 2.89 + 5.14$  ----- 7= \_\_\_\_\_

8.  $(0.758 + 3.68 - 2.42) - (2.2 + 2.32)$  ----- 8= \_\_\_\_\_

9.  $67.6 \times 463 \times 183$  ----- 9= \_\_\_\_\_

10.  $281 \times 956 \times 912 \times 119$  ----- 10= \_\_\_\_\_

11. Calculate the product of the mean and median of the first ten prime numbers. ----- 11= \_\_\_\_\_

12. One million is what percent of one trillion. ----- 12= \_\_\_\_\_ %

13. The sum of two integers is 3110. The difference of these two integers is 1090. Calculate the value of the largest integer. ----- 13= \_\_\_\_\_ INT.

14.  $(-57/69)[230 - 56]$  -----14= \_\_\_\_\_

15.  $(318)[379 \times 411 \times 133]$  -----15= \_\_\_\_\_

16.  $\{628/397\} \left[ \frac{536}{190 + 325} \right]$  -----16= \_\_\_\_\_

17.  $\{(102)(128 - 47)(43)\} - 3.26 \times 10^5$  -----17= \_\_\_\_\_

18.  $\left[ \frac{(1780/1280) - (3220/676)}{0.293/0.271} \right]$  -----18= \_\_\_\_\_

19.  $\left[ \frac{(1.48 + 1.61)}{522/377} \right] \left[ \frac{0.507}{0.885} \right]$  -----19= \_\_\_\_\_

20.  $\frac{440}{(381 - 118)} - \frac{(462 - 563)}{313}$  -----20= \_\_\_\_\_

21.  $\frac{(0.00181)(0.0661)}{(1.18 \times 10^{-4})} (0.00173 - 0.00212)$  -----21= \_\_\_\_\_

22.  $\frac{(0.00132 + 0.00122 - 0.00185)}{\{(0.0256 - 0.0123)/(3.76)\}}$  -----22= \_\_\_\_\_

23.  $\frac{(\pi)(165/40)(96/79)}{(164/105)}$  -----23= \_\_\_\_\_

24. Charlie buys a printer for \$129.99. Tax is 8.25%. If he mails in his receipt, he gets a \$25 rebate check. Calculate the final cost of the printer. -----24=\$ \_\_\_\_\_

25. A shipping container holds 1,267,345 ounces of oil. Convert this amount to liters. -----25= \_\_\_\_\_ l

26. On the opening weekend of a movie in a small town, 45 people went to the showing on Friday night , 106 people went on Saturday night and 22 went on both nights. Calculate the total number of people that saw the movie on those two nights. -----26= \_\_\_\_\_ INT.

27.  $\frac{(8.44 \times 10^{11}) + (4.55 \times 10^{11})}{(-0.0153)(0.00465) - 1.33 \times 10^{-5}}$  -----27= \_\_\_\_\_

28.  $\frac{(33.5 - 11.6)(259 + 259)}{(4.04 \times 10^{12})}$  -----28= \_\_\_\_\_

29.  $(0.0215)[(0.00389/0.00212)(0.042 + 0.00882)]$  -----29= \_\_\_\_\_

30.  $(6.18)\left[\frac{131}{(1.61 \times 10^8)}\right]$  -----30= \_\_\_\_\_

31.  $\frac{(0.0987 + 0.208)}{(2.85 \times 10^{12})}$  -----31= \_\_\_\_\_

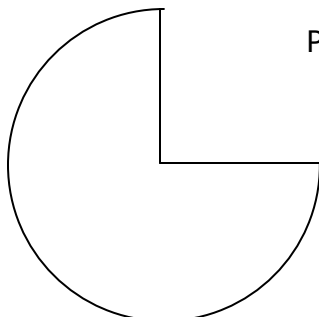
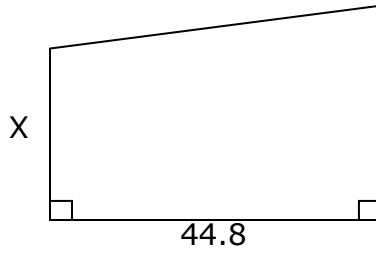
32.  $\frac{1}{\pi} + \frac{1}{(\pi)(4.45 - 5.72)}$  -----32= \_\_\_\_\_

33.  $\frac{1}{413} - \frac{1}{429} + \frac{1}{120}$  -----33= \_\_\_\_\_

34.  $\left[\frac{1/152}{1/51.1}\right][6.95 \times 10^6]$  -----34= \_\_\_\_\_

35. Calculate the number of degrees in 11pi over 6 radians. -----35= \_\_\_\_\_°

36. A square and a circle have the same area. If the radius of the circle is 1.85 cm, calculate the length of a side of the square. -----36= \_\_\_\_\_ cm

<p style="text-align: center;"><b>THREE-QUARTER CIRCLE</b></p>  <p style="text-align: right;">Perimeter = 10101</p> <p style="text-align: right;">Radius = ?</p> <p>37= _____</p>	<p style="text-align: center;"><b>TRAPEZOID</b></p>  <p style="text-align: right;">Area = 1181</p> <p style="text-align: right;">X = ?</p> <p>38= _____</p>
--	---

39.  $(14.9 + 8.02 + 14.2)^2(143 + 198)^2$  -----39= \_\_\_\_\_

40.  $(1.53 + 0.53)^2(51.1 + 51.1)^2$  -----40= \_\_\_\_\_

41.  $\frac{(22900 + 11400)^3}{(0.0409 - 0.0406)^2}$  -----41= \_\_\_\_\_

42.  $(7540)\sqrt{44.1 + 107 + 119}$  -----42= \_\_\_\_\_

43.  $\sqrt{2120} + \sqrt{1010 + 1870} - (\pi)\sqrt{523}$  -----43= \_\_\_\_\_

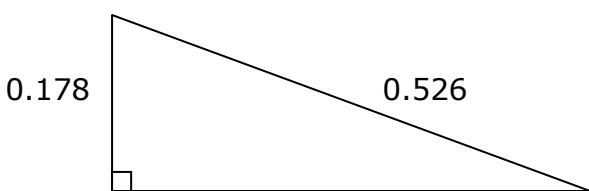
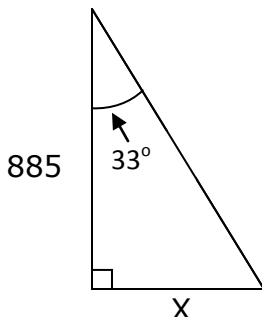
44.  $(1/\pi)^3\sqrt[3]{\frac{0.0496 + 0.106}{0.0373 - 0.0248}}$  -----44= \_\_\_\_\_

45.  $\frac{(92 + 95.6)^{1/4}}{(6.09 - 2.46)^{1/3}}$  -----45= \_\_\_\_\_

46.  $(60600)\sqrt[3]{680 + 670 - 265}$  -----46= \_\_\_\_\_

47. Calculate  $-3251^{6677}$ . -----47= \_\_\_\_\_

48. The price of a 2016 truck was \$52,345, but after being on the lot for 6 months, the price dropped to \$45,850. Calculate the percent decrease in price. -----48= \_\_\_\_\_%

<p style="text-align: center;">RIGHT TRIANGLE</p>  <p style="text-align: center;">Area = ?</p> <p>49= _____</p>	<p style="text-align: center;">RIGHT TRIANGLE</p>  <p style="text-align: center;">X = ?</p> <p>50= _____</p>
--	--

51.  $\frac{\sqrt{0.202 + \pi + 0.74}}{(1.82 - 0.762 + 0.924)^3}$  -----51=\_\_\_\_\_

52.  $\sqrt{\frac{3.43 \times 10^9}{(821)(101)} + \frac{(32000 - 9680)}{(41.9 + 51.4)}}$  -----52=\_\_\_\_\_

53.  $\left[ \frac{329 + 192 + \sqrt{2.05 \times 10^5 + 1.76 \times 10^5}}{8830/7170} \right]^3$  -----53=\_\_\_\_\_

54.  $(1.02)^2 \sqrt{(121)/(1.15)} - (5.82 + 4.38)$  -----54=\_\_\_\_\_

55.  $0.131 + \sqrt{(74.8)/(436)} - (0.613 + 0.0956)^2$  -----55=\_\_\_\_\_

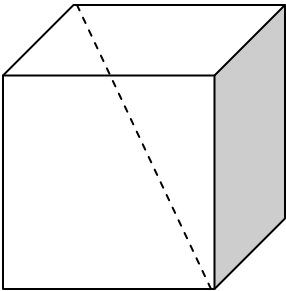
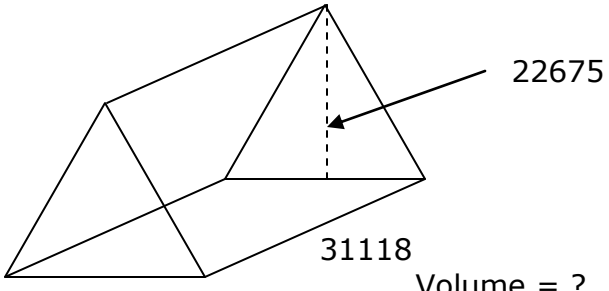
56.  $\sqrt{\frac{(1.79 \times 10^5)(72300)}{(1.28 \times 10^5)(3.84 \times 10^5)}} - 0.461 + 0.392$  -----56=\_\_\_\_\_

57.  $(\text{rad}) \sin(77.9) + (90.6/34.8)$  -----57=\_\_\_\_\_

58.  $\sqrt{\frac{(505)(1310)}{(333) + (1380)}} + 1/(0.551)^5$  -----58=\_\_\_\_\_

59. Mindy makes 3¼ % commission on her sales. Calculate her total sales if she earned a \$625 commission check. -----59=\$\_\_\_\_\_

60. Mitch drives to work at an average speed of 60 mph and arrives ten minutes early. If he slows his average speed to 50 mph, he arrives five minutes late. Calculate his average speed to arrive right on time. -----60=\_\_\_\_\_ mph

<p style="text-align: center;"><b>CUBE</b></p>  <p style="text-align: right;">Volume = 0.000357</p> <p style="text-align: right;">Inner Diagonal = ?</p> <p>61= _____</p>	<p style="text-align: center;"><b>EQUILATERAL TRIANGULAR PRISM</b></p>  <p style="text-align: right;">22675</p> <p style="text-align: right;">31118</p> <p style="text-align: right;">Volume = ?</p> <p>62= _____</p>
--	---

63.  $\frac{5!}{3!} + 4!$  -----63= \_\_\_\_\_

64.  $(4.14 \times 10^5 - 4.47 \times 10^5)^5 (8.98 \times 10^7)$  -----64= \_\_\_\_\_

65.  $(49 - \pi)e^{0.927}$  -----65= \_\_\_\_\_

66. (rad)  $\frac{\tan(9.93)}{830/139}$  -----66= \_\_\_\_\_

67. (deg)  $[9.42]\tan(320^\circ - 297^\circ)$  -----67= \_\_\_\_\_

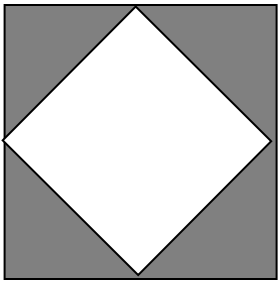
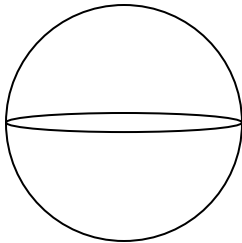
68. (deg)  $\frac{\sin(418^\circ)}{\tan(418^\circ)} [7.13]$  -----68= \_\_\_\_\_

69. (rad)  $\tan[(3.81 - 5.2)(0.561)]$  -----69= \_\_\_\_\_

70.  $(123 - 394)e^{\pi - 0.982}$  -----70= \_\_\_\_\_

71. Calculate the density of a cube with a mass of 24 grams and each edge measuring 12 cm. -----71= \_\_\_\_\_ g/cm<sup>3</sup>

72. Calculate the probability of drawing a double domino from a standard double-six domino set. -----72= \_\_\_\_\_

SQUARES	SPHERE
 <p style="margin-left: 20px;">Shaded Area = 9513</p> <p style="margin-left: 20px;">Side of Large Square = ?</p> <p>73= _____</p>	 <p style="margin-left: 20px;">Diameter = 23000</p> <p style="margin-left: 20px;">Ratio of Surface Area to Volume = ?</p> <p>74= _____</p>

75.  $\frac{(1.75)^{0.177}(4.99)^{0.312}}{(74.4 - 34.6)^{-7}}$  -----75= \_\_\_\_\_

76.  $\ln\left[\frac{96 + 88.4 + 271}{412 + 621 - 219}\right]$  -----76= \_\_\_\_\_

77.  $(22400)10^{(0.375)(4.76)}$  -----77= \_\_\_\_\_

78.  $\ln\left[\frac{234 + 123 + 179}{81.3 - 27.5 - 25.6}\right]$  -----78= \_\_\_\_\_

79.  $1 + 2 + 3 + \dots + 211$  -----79= \_\_\_\_\_

80.  $1 + (0.98) + \frac{(0.98)^2}{2} + \frac{(0.98)^3}{6} + \frac{(0.98)^4}{24}$  -----80= \_\_\_\_\_



## 2016-2017 TMSCA Middle School Calculator Test 11

Page 1	Page 2	Page 3	Page 4
1 = 391 = $3.91 \times 10^2$	14 = -144 = $-1.44 \times 10^2$	27 = $-1.54 \times 10^{16}$	39 = $1.60 \times 10^8$
2 = 71.0 = $7.10 \times 10^1$	15 = $6.59 \times 10^9$	28 = $2.81 \times 10^{-9}$	40 = 44300 = $4.43 \times 10^4$
3 = 10500 = $1.05 \times 10^4$	16 = 1.65 = $1.65 \times 10^0$	29 = 0.00200 = $2.00 \times 10^{-3}$	41 = $4.48 \times 10^{20}$
4 = 64.1 = $6.41 \times 10^1$	17 = 29300 = $2.93 \times 10^4$	30 = $5.03 \times 10^{-6}$	42 = 124000 = $1.24 \times 10^5$
5 = -18800 = $-1.88 \times 10^4$	18 = -3.12 = $-3.12 \times 10^0$	31 = $1.08 \times 10^{-13}$	43 = 27.9 = $2.79 \times 10^1$
6 = -65.2 = $-6.52 \times 10^1$	19 = 1.28 = $1.28 \times 10^0$	32 = 0.0677 = $6.77 \times 10^{-2}$	44 = 0.738 = $7.38 \times 10^{-1}$
7 = 11.1 = $1.11 \times 10^1$	20 = 2.00 = $2.00 \times 10^0$	33 = 0.00842 = $8.42 \times 10^{-3}$	45 = 2.41 = $2.41 \times 10^0$
8 = -2.50 = $-2.50 \times 10^0$	21 = -0.000395 = $-3.95 \times 10^{-4}$	34 = $2.34 \times 10^6$	46 = 623000 = $6.23 \times 10^5$
9 = $5.73 \times 10^6$	22 = 0.195 = $1.95 \times 10^{-1}$	35 = 330 = $3.30 \times 10^2$	47 = $-5.46 \times 10^{23449}$
10 = $2.92 \times 10^{10}$	23 = 10.1 = $1.01 \times 10^1$	36 = 3.28 = $3.28 \times 10^0$	48 = 12.4 = $1.24 \times 10^1$
11 = 155 = $1.55 \times 10^2$	24 = \$115.71	37 = 1500 = $1.50 \times 10^3$	49 = 0.0441 = $4.41 \times 10^{-2}$
12 = 0.0001 = $1.00 \times 10^{-4}$	25 = 37500 = $3.75 \times 10^4$	38 = 23.6 = $2.36 \times 10^1$	50 = 575 = $5.75 \times 10^2$
13 = 2100 INT.	26 = 129 INT.		

## 2016-2017 TMSCA Middle School Calculator Test 11 Answer Key

### Page 5

$$51 = 0.260$$
$$= 2.60 \times 10^{-1}$$

$$52 = 443$$
$$= 4.43 \times 10^2$$

$$53 = 7.90 \times 10^8$$

$$54 = 0.472$$
$$= 4.72 \times 10^{-1}$$

$$55 = 0.0431$$
$$= 4.31 \times 10^{-2}$$

$$56 = 0.444$$
$$= 4.44 \times 10^{-1}$$

$$57 = 3.20$$
$$= 3.20 \times 10^0$$

$$58 = 39.3$$
$$= 3.93 \times 10^1$$

$$59 = \$19230.77$$

$$60 = 52.9$$
$$= 5.29 \times 10^1$$

### Page 6

$$61 = 0.123$$
$$= 1.23 \times 10^{-1}$$

$$62 = 9.24 \times 10^{12}$$

$$63 = 44.0$$
$$= 4.40 \times 10^1$$

$$64 = -3.51 \times 10^{30}$$

$$65 = 116$$
$$= 1.16 \times 10^2$$

$$66 = 0.0926$$
$$= 9.26 \times 10^{-2}$$

$$67 = 4.00$$
$$= 4.00 \times 10^0$$

$$68 = 3.78$$
$$= 3.78 \times 10^0$$

$$69 = -0.989$$
$$= -9.89 \times 10^{-1}$$

$$70 = -2350$$
$$= -2.35 \times 10^3$$

$$71 = 0.0139$$
$$= 1.39 \times 10^{-2}$$

$$72 = 0.250$$
$$= 2.50 \times 10^{-1}$$

### Page 7

$$73 = 138$$
$$= 1.38 \times 10^2$$

$$74 = 0.000261$$
$$= 2.61 \times 10^{-4}$$

$$75 = 2.88 \times 10^{11}$$

$$76 = -0.581$$
$$= -5.81 \times 10^{-1}$$

$$77 = 1.37 \times 10^6$$

$$78 = 2.94$$
$$= 2.94 \times 10^0$$

$$79 = 22400$$
$$= 2.24 \times 10^4$$

$$80 = 2.66$$
$$= 2.66 \times 10^0$$

TMSCA 16-17 MS CA Test #11 Solutions to Word and Geometry Problems

**11.** The first 10 prime numbers are: 2,3,5,7,11,13,17,19,23,29.

The median is  $\frac{11+13}{2} = 12$ . The mean is 12.9  

$$\frac{2+3+5+7+11+13+17+19+23+29}{10}$$
 12(12.9)

**12.**  $\frac{1000000}{1000000000000} = \frac{x}{100}$

**13.**  $x + y = 3110$   
 $x - y = 1090$   
 Add these equations together  
 $2x = 4200; x = 2100$

**24.**  $129.99(1.0825) - 25$

**25.**  $\frac{1267345}{128} =$  gallons. On RPN calculator there is a key which will convert this to liters.

**26.** Use a Venn diagram that would show 23 went on Friday only, 22 went on both nights and 84 went on Saturday only.  $22 + 23 + 84$

**35.** Substitute 180 degrees for  $\pi$ . Or on the RPN calculator, enter  $\frac{11\pi}{6}$  and then use the key that converts from radians to degrees.

**36.**  $\pi(1.85)^2 = x^2$   
 $x = \sqrt{\pi(1.85)^2}$

**37.**  $\frac{3}{4}(2\pi r) + 2r = 10101$   
 $\frac{6}{4}\pi r + 2r = 10101$   
 $r\left(\frac{6}{4}\pi + 2\right) = 10101$   
 $r = \frac{10101}{\frac{6}{4}\pi + 2}$

**38.**  $\frac{(29.1+x)(44.8)}{2} = 1181$   
 $x = \frac{1181(2)}{44.8} - 29.1$

**47.** The answer will be negative so work the problem without the negative, but remember to put it in your answer. Using RPN calculator

6677  3251

*(Digits to the left of the decimal are 23449. Write down 23449)*

23449   (This gives 5.46 E 0. The answer should be 5.46 x 10<sup>23449</sup>)

**48.** On RPN calculator enter 52345. Then punch 45850 followed by the % change key. The negative sign is not needed since the problem says "decrease".

Without the RPN calculator:  

$$\frac{45850 - 52345}{52345}$$

**49.**  $\frac{(\sqrt{.526^2 - .178^2})(.178)}{2}$

**50.**  $\frac{\tan 33}{1} = \frac{x}{885}$   
 $x = 885(\tan 33)$

**59.**  $.0325x = 625$   
 $x = \frac{625}{.0325}$

Look at SHOW key for exact amount.

**60.** x = time the trip should take

	Rate	Time	dist
Fast	60	x-1/6	60x-10
slow	50	X+5/60	50x+25/6

$$60x - 10 = 50x + \frac{25}{6}$$

Time  $x = \frac{85}{60}$

Substitute this into 60x- 10, gives the distance of 75 miles to work.

$$rate = \frac{d}{t} = \frac{75}{\frac{85}{60}}$$

**61.** edge =  $\sqrt[3]{.000357}$

Edge times  $\sqrt{3} =$  inner diagonal.

**62.**  $V = Bh$  where B = area of equilateral triangle and h = 31118. Area of triangle =

$$\frac{22675^2\sqrt{3}}{3}$$

**71.**  $D = \frac{M}{V} = \frac{24}{12^3}$

**72.** There are 28 dominoes in a standard set. 7 of them are doubles (blank, 1,2,3,4,5,6)

$$\frac{7}{28}$$

**73.** The large square is twice the shaded area. Side =

$$\sqrt{(9513)(2)}$$

**74.** Using formulas, the ratio is

$$\frac{4\pi r^2}{\frac{4}{3}\pi r^3}$$
 which simplifies to

$$\frac{3}{r} = \frac{3}{\left(\frac{23000}{2}\right)}$$