

Test #8 - TMSCA Calculator - 2013-2014

11. The average of the first six values is \$120.37. The average of the next seven values is \$72.83. What is the overall average of the values?

$$\frac{6(120.37) + 7(72.83)}{13} = \bar{X}$$
$$\bar{X} = \$94.77$$

12. The bridge maximum load is fifteen tons. What is this maximum in kilograms?

$$15 \text{ tons} = 30000 \text{ lbs}$$

Use the conversion key

$$13600 \text{ kg}$$

13. Tim worked through number seventy-seven on his calculator test. He missed five problems and skipped five problems. Calculate his score.

77 problems worked

skipped 5

missed 5

Multiply 5 times the number worked

Subtract 9 for each problem skipped or missed

$$\begin{aligned} \text{score} &= 5(77) - (10)(9) \\ &= 295 \end{aligned}$$

24. The Coopers' are replacing all of the appliances in their kitchen. The refrigerator cost \$1274.99, the oven cost \$999.99, the microwave cost \$147.99 and the dishwasher \$359.99. The store charged 8.25% sales tax on the purchase. What was the total cost?

$$\begin{aligned} \text{Total cost} &= (1.0825 \text{ tax})(1274.99 + 999.99 + 147.99 + 359.99) \\ &= \$3012.55 \end{aligned}$$

25. Convert negative eighty-two degrees Celsius to degrees Fahrenheit .

$$-82^{\circ}C = \underline{\hspace{2cm}}^{\circ}F$$

Use the conversion key

$$= -116^{\circ}F$$

26. A piggy bank is full of pennies, nickels, dimes, and quarters. One-third are pennies, one-sixth are nickels, five-twelfths are dimes and the remaining twenty-seven are quarters. How many are dimes?

$$\frac{1}{3} = \frac{4}{12} \text{ pennies}$$

$$\frac{1}{6} = \frac{2}{12} \text{ nickels}$$

$$\frac{5}{12} = \frac{5}{12} \text{ dimes}$$

$$\frac{1}{12} = 27 \text{ quarters}$$

How many dimes?

$$\text{If } \frac{1}{12} = 27 \text{ quarters,}$$

$$\text{then } \frac{5}{12} = (5)(27) \text{ 135 dimes}$$

35. The ratio of the length to the width of a rectangle is 7 : 5. The perimeter of the rectangle is 222 cm. Calculate the area of the rectangle.

$$P = 222$$

$$.5P = 111$$

$$L = \frac{7}{12}$$

$$W = \frac{5}{12}$$

$$A = LW$$

$$= \left[\left(\frac{7}{12} \right) (111) \right] \left[\left(\frac{5}{12} \right) (111) \right]$$

$$= 2990$$

36. Calculate $-(-8799)^{761}$

The answer will be positive.

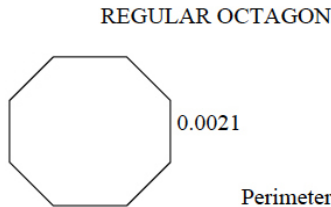
$$\begin{aligned} -(-8799)^{761} &= (761)(\log 8799) \\ &= 3001.71375477... \end{aligned}$$

Take it out of logarithm by doing the following:

$$\begin{aligned} &\text{Subtract 3001 from the display,} \\ &= (10^{-.71375477...})(10^{3001}) \\ &= 5.17 \times 10^{3001} \end{aligned}$$

37. $s = .0021$

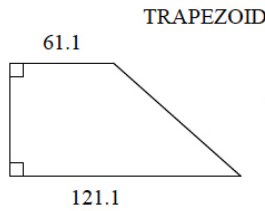
$$\begin{aligned} P &= 8s \\ &= (8)(.0021) \\ &= .0168 \end{aligned}$$



Perimeter = ?

38. $A = \frac{h(b_1 + b_2)}{2}$

$$\begin{aligned} h &= \frac{2A}{b_1 + b_2} \\ &= \frac{(2)(7752)}{61.1 + 121.1} \\ &= 85.1 \end{aligned}$$



Area = 7752

Height = ?

47. What is the 31st hexagonal number?

$$\begin{aligned} \text{31st hexagonal number} &= n(2n - 1) \\ &= 31(2(31) - 1) \\ &= 31(61) \\ &= 1891 \text{ int} \end{aligned}$$

Triangular Numbers:

Formula: $\frac{n(n+1)}{2}$

1 3 6 10

Pentagonal Numbers:

Formula: $\frac{n(3n-1)}{2}$

1 5 12 22

Square Numbers:

Formula: n^2

1 4 9 16

Hexagonal Numbers:

Formula: $n(2n - 1)$

1 6 15 28

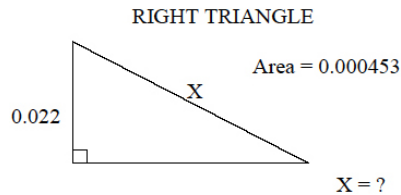
48. Circle T has a radius of 12.18 cm and Circle M has a radius of 7.72 cm. What is the ratio of the area of Circle T to the circumference of Circle M?

$$\begin{aligned} \text{Ratio} &= \frac{A_{\text{of circle T}}}{C_{\text{of circle M}}} \\ &= \frac{\pi r^2}{2\pi r} \\ &= \frac{\pi(12.18)^2}{2\pi(7.72)} \\ &= 9.61 \end{aligned}$$

49. $A = \frac{bh}{2}$

$$\begin{aligned} b &= \frac{2A}{h} \\ x &= \sqrt{a^2 + b^2} \end{aligned}$$

$$\begin{aligned} &= \sqrt{(.022)^2 + \left(\frac{2A}{h}\right)^2} \\ &= \sqrt{(.022)^2 + \left(\frac{2(.000453)}{.022}\right)^2} \\ &= .0467 \end{aligned}$$

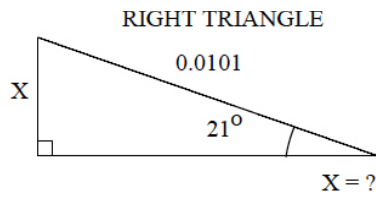


$$50. \frac{\sin \theta}{1} = \frac{\text{Opposite}}{\text{Hypotenuse}}$$

$$\frac{\sin 21^\circ}{1} = \frac{x}{.0101}$$

$$x = (\sin 21^\circ)(.0101)$$

$$x = .00362$$



59. What is the slope of the line that is perpendicular to the line $-3x + 7y = -2$?

$$y = mx + b \quad \text{where } m = \text{slope and } b = \text{y-intercept}$$

$$-3x + 7y = -2$$

$$7y = 3x - 2$$

$$y = \frac{3x - 2}{7}$$

$$y = \frac{3}{7}x - \frac{2}{7}$$

$$m = \frac{3}{7}$$

m of line perpendicular to this line is:

$$m = -\frac{7}{3}$$

$$= -2.33$$

60. The distance, in meters, which a juesta falls after reaching its' maximum altitude varies directly as the cube of the elapsed time, in seconds. The juesta takes two seconds to fall 44.17 m. How long will it take to fall 100.11 m?

$$d = kt^3$$

$$t^3 = \frac{d}{k}$$

$$k = \frac{d}{t^3}$$

$$t = \sqrt[3]{\frac{d}{k}}$$

$$k = \frac{44.17}{(2)^3}$$

$$t = \sqrt[3]{\frac{100.11}{\frac{44.17}{2^3}}}$$

$$t = 2.63$$

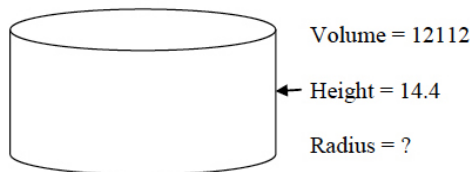
$$61. V = \pi r^2 h$$

$$r = \sqrt{\frac{V}{\pi h}}$$

$$= \sqrt{\frac{12112}{\pi(14.4)}}$$

$$= 16.4$$

CYLINDER



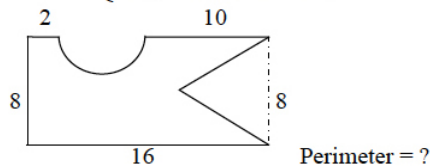
$$62. P = (8) + (16) + (2) + (10) + \left(\frac{C}{2}\right) + (8) + (8)$$

$$= (8) + (16) + (2) + (10) + \left(\frac{2\pi r}{2}\right) + (8) + (8)$$

$$= (8) + (16) + (2) + (10) + (2\pi) + (8) + (8)$$

$$= 58.3$$

RECTANGLE, SEMICIRCLE,
EQUILATERAL TRIANGLE



71. A bag of marbles contains 8 blue, 9 green, and 7 black. What is the probability of drawing 2 green marbles, if the first one is not replaced after drawing?

8 blue

9 green

7black

$$P(2 \text{ green w/o replacement}) = \left(\frac{9}{24}\right)\left(\frac{8}{23}\right)$$

$$= .125$$

72. David invested \$1000 in a savings account at 4.5%. After 2 years, he invested an additional \$2000. How much would he have after 6 years simple interest of his initial investment?

Ans:3630.00

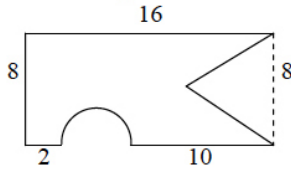
73. $A = A_{\text{rectangle}} - A_{\text{semi-circle}} - A_{\text{equilateral triangle}}$

$$= LW - \frac{\pi r^2}{2} - \frac{s^2 \sqrt{3}}{4}$$

$$= [(8)(16)] - \left[\frac{\pi(2)^2}{2} \right] - \left[\frac{(8)^2 \sqrt{3}}{4} \right]$$

$$= 94.0$$

RECTANGLE, SEMICIRCLE
EQUILATERAL TRIANGLE



Area = ?

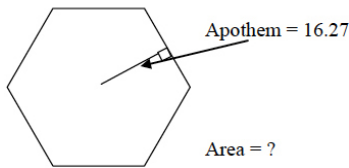
74. $\frac{s\sqrt{3}}{2} = 16.27$ $A = 6 \left(\frac{s^2 \sqrt{3}}{4} \right)$

$$s = \frac{(2)(16.27)}{\sqrt{3}} = 6 \left(\frac{18.8^2 \sqrt{3}}{4} \right)$$

$$s = 18.8$$

$$= 917$$

REGULAR HEXAGON



or

$$A = \frac{1}{2} pa \quad \text{where } p = \text{perimeter and } a = \text{apothem}$$

$$= \left(\frac{1}{2} \right) [(6)(18.8)] (16.27)$$

$$= 917$$