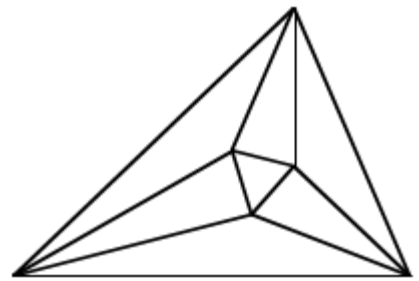


Meet 3 – Event A 2019-20

Questions are worth 2-2-2-4-4 points respectively.

No calculators allowed



_____ 1. What is the greatest common factor of 48 and 78?

_____ 2. Write the expression in simplest radical form.
 $\sqrt{108}$

$n =$ _____ 3. The equation shows $\frac{1}{49}$ as the product of powers of 7.
$$\frac{1}{49} = 7^3 \times 7^n$$

What value for n makes the equation true?

_____ ft^3 4. Christy is helping to fill a tank with water. The tank is a rectangular prism that measures 8 feet wide, 11 feet long, and 6 feet deep. The tank is $\frac{1}{3}$ full of water. How much more water, in cubic feet, should Christy add to fill the tank completely?

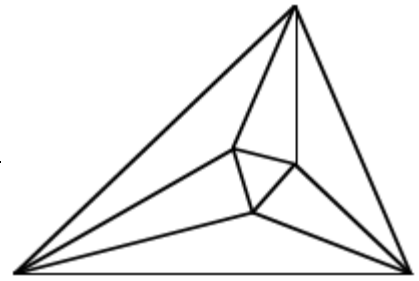
_____ % 5. Haakon, Andrew, Elijah, and Rose shared a pizza.

- Haakon ate 16% of the pizza.
- Andrew ate 50% more of the pizza than Haakon ate.
- Elijah ate 50% more of the pizza than Andrew ate.
- Rose ate the rest of the pizza.

What percentage of the pizza did Rose eat?

Name _____ School _____

Meet 3 – Event A 2019-20



Answers

Questions are worth 2-2-2-4-4 points respectively.

6 1. .

$6\sqrt{3}$ 2. $\sqrt{108} = \sqrt{9 \times 12} = 3\sqrt{4 \times 3} = 6\sqrt{3}$

$n = -5$ 3. $\frac{1}{49} = \frac{1}{7^2} = 7^{-2}$
 $7^{-2} = 7^{3+n} = 7^{3+(-5)}$

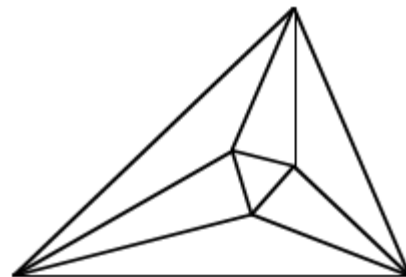
352 ft^3 4. $8 \times 11 \times 6 = 528$
 $528 \times 2/3 = \mathbf{352}$

24% 5. H: 0.16
A: $1.5(0.16) = 0.24$
E: $1.5(0.24) = 0.36$
R: $1 - (0.16 + 0.24 + 0.36) = 0.24 = \mathbf{24\%}$

Meet 3 – Event B 2019-20

Questions are worth 2-2-2-4-4 points respectively.

No calculators allowed



_____ 1. What is the least common multiple (LCM) of 16 and 20?

$x =$ _____ 2. Solve for x . Write your answer as a reduced fraction.

$$\frac{1}{4}(2x + 8) = 1.5 + 4x$$

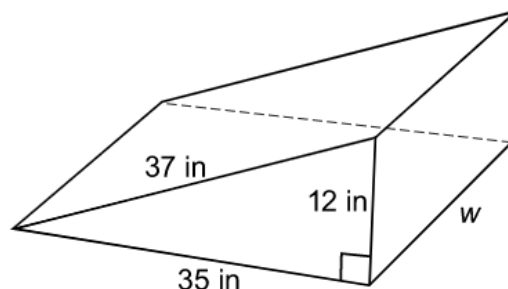
_____ 3. Evaluate the expression when $x = 2$.

$$(x^2 + 2x + x^3)^2 \cdot (x^4)^{-2}$$

_____ mm^3 4. A microscopic crystal is in the shape of a cube with an edge length of 8^{-5} mm. What is the volume, in mm^3 , of the crystal? Write your answer in exponential form using only positive exponents.

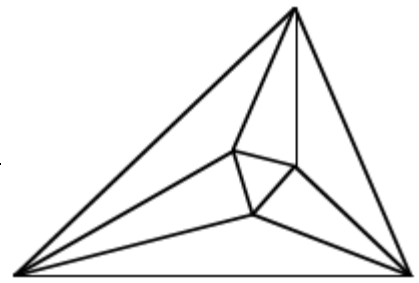
$w =$ _____ in 5. A figure is shown. The total surface area of the figure is 2,268 square inches.

- $V =$ _____ in^3
- Find the width (w), in inches, of the figure.
 - Find the volume (V), in cubic inches, of the figure.



Name _____ School _____

Meet 3 – Event B 2019-20



Answers

Questions are worth 2-2-2-4-4 points respectively.

80 1. .

$x = 1/7$ 2. $\frac{1}{4}(2x + 8) = 1.5 + 4x; \frac{1}{2}x + 2 = \frac{3}{2} + 4x; \frac{1}{2} = \frac{7}{2}x; x = \frac{1}{7}$

1 3. $(x^2 + 2x + x^3)^2 \cdot (x^4)^{-2} = (4 + 4 + 8)^2 \cdot 16^{-2}$
 $(16)^2 \cdot 16^{-2} = 16^0 = 1$

$\frac{1}{8^{15}} \text{ mm}^3$ 4. $(8^{-5})^3 = 8^{-15} = \frac{1}{8^{15}}$

$w = 22$ in 5. $SA: 2\left(\frac{35 \times 12}{2}\right) + 35w + 12w + 37w = 2268$
 $SA: 420 + 84w = 2268; 84w = 1848; w = 22$

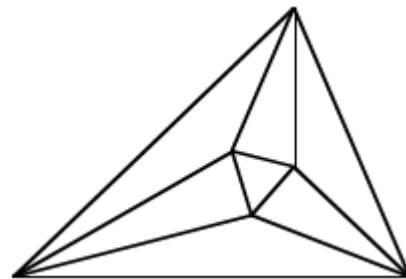
$V = 4,620 \text{ in}^3$ $V: \left(\frac{35 \times 12}{2}\right) \times 22 = 210 \times 22 = 4620$

2 points per
response

Meet 3 – Team Event 2019-20

Questions are worth 4 points each.

No calculators allowed



_____ 1. A cube is painted red and then cut into 27 congruent cubes. How many of these cubes are painted red on exactly one face?

\$ _____ 2. Elsa has had her bank account for 2 years. During the first year, the amount of money in her account increased by 200%. During the second year, it decreased by 25%. If her account currently contains \$450, what was the amount of her initial deposit?

_____ 3. Simplify. Use only positive exponents in your answer.

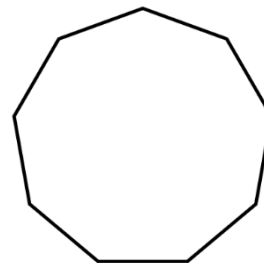
$$\frac{3x^{-7} \cdot 4x^0}{8x^3 \cdot x^{-2}}$$

_____ 4. There are $10,300 \text{ cm}^3$ of water in a cooler. Don completely fills cone-shaped cups with water from the cooler. Each cup has a radius of 3 cm and a height of 7 cm. What is the maximum number of cups Don can fill with the water from the cooler?

Use $\frac{22}{7}$ in your calculations for π .

_____ 5. Given $a^{1/5} = b$, what is the value of $a^{2/5}$?

_____ 6. How many diagonals does the nonagon have?



$x =$ _____ 7. Solve for x .

$$-\frac{1}{3}(4 - 2x) = \frac{5}{2}x + 6$$

_____ % 8. The speed of light is approximately 3×10^8 meters per second. A comet is traveling at approximately 6×10^4 meters per second. At what **percentage** of the speed of light is the comet traveling?

_____ 9. Selma and Tran each have a bag of blueberries. Selma's bag has 96 blueberries, and Tran's bag has 128 blueberries. They each divide their blueberries into equal-sized groups. What is the greatest number of blueberries that could be in both Selma's and Tran's groups?

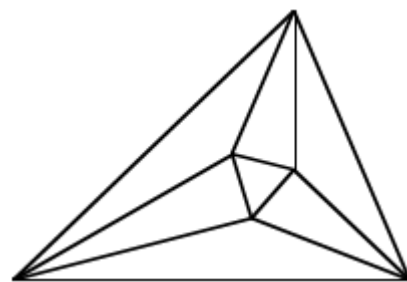
_____ 10. Simplify: $\sqrt{135x^6yz^5}$

Name _____ School _____

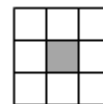
Meet 3 – Team Event 2019-20

Answers

Questions are worth 4 points each.



- _____ 6 1. Each face of the larger cube must have 9 congruent squares. Only the middle square will get painted on exactly one side. Since there are 6 faces, there are 6 such squares.

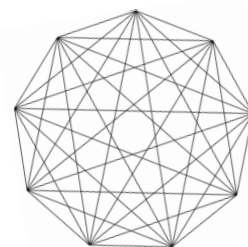


- _____ \$ 200 2. x = initial deposit
 $x + 2x = 1^{\text{st}} \text{ year}$; $0.75(x + 2x) = 2^{\text{nd}} \text{ year}$
 $0.75(x + 2x) = 450$; $0.75(3x) = 450$; $2.25x = 450$; $x = 200$

_____ $\frac{3}{2x^8}$ 3. $\frac{3x^{-7} \cdot 4x^0}{8x^3 \cdot x^{-2}} = \frac{3 \cdot 4 \cdot x^2}{x^7 \cdot 8x^3} = \frac{12x^2}{8x^{10}} = \frac{3}{2x^8}$

- _____ 156 4. Volume of each cup $= \frac{1}{3}\pi r^2 h = \frac{1}{3}\pi(9)(7) = 21\pi = 21\left(\frac{22}{7}\right) = 66$
 $10300 \div 66 = 156.\overline{06} \rightarrow \text{Max cups} = 156$

_____ b^2 5. $a^{1/5} \cdot a^{1/5} = a^{(1/5+1/5)} = a^{2/5}$; $b \cdot b = b^2$



- _____ 27 6. From each vertex, 6 diagonals can be drawn. There are 9 vertices, so there are 54 possible diagonals. However, this number needs to be cut in half to avoid duplicating diagonals. (For instance, a diagonal drawn from vertex 1 to vertex 5 is the same as the diagonal drawn from vertex 5 to vertex 1.)

_____ $x = -4$ 7. $-\frac{1}{3}(4 - 2x) = \frac{5}{2}x + 6$; $-\frac{4}{3} + \frac{2}{3}x = \frac{5}{2}x + 6$; $\left(\frac{2}{3} - \frac{5}{2}\right)x = 6 + \frac{4}{3}$; $\left(\frac{4}{6} - \frac{15}{6}\right)x = \frac{18}{3} + \frac{4}{3}$
 $\left(\frac{4}{6} - \frac{15}{6}\right)x = \frac{18}{3} + \frac{4}{3}$; $-\frac{11}{6}x = \frac{44}{6}$; $x = -4$

_____ 0.02 % 8. $\frac{6 \times 10^4}{3 \times 10^8} = \frac{p}{100}$; $600 \times 10^4 = (3 \times 10^8)p$; $\frac{6 \times 10^6}{3 \times 10^8} = p$
 $2 \times 10^{-2} = p$; **0.02 = p**

_____ 32 9. GCF(96, 128) = 32

_____ $3x^3z^2\sqrt{15yz}$ 10. $\sqrt{135x^6yz^5} = \sqrt{9 \cdot 15 \cdot (x^2)^3 \cdot y \cdot (z^2)^2 \cdot z} = 3x^3z^2\sqrt{15yz}$