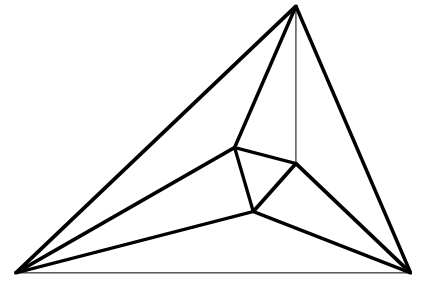


Meet 5 – Event A 2014-2015

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

NO CALCULATORS ALLOWED



_____ 1. Simplify:

$$1 + 2x^2 - 5x(3 - x)$$

Write your answer in descending order.

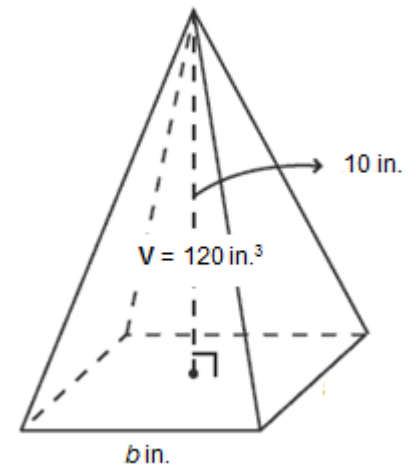
_____ 2. One factor of the expression $6x^2 + 7x - 20$ is $(2x + 5)$. What is the other factor?

_____ 3. The equation for Line A is $y = -\frac{1}{3}x + 12$. Line B is perpendicular to Line A and has a y-intercept of $(0, 2)$. Where do Lines A and B intersect?

Use the following information to answer questions 4 and 5.

The right square pyramid has a height of 10 inches and a volume of 120 cubic inches.

_____ in. 4. What is the base length (b), in inches?



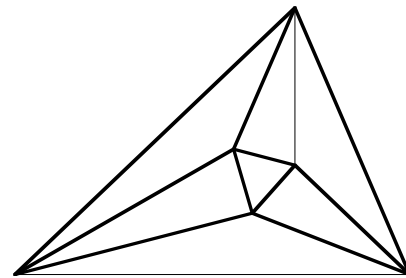
_____ in.² 5. What is the surface area, rounded to the nearest hundredth of a square inch?
(Hint: $\sqrt{109} \approx 10.44$)

Name _____ School _____

Meet 5 – Event A 2014-2015

ANSWERS

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



$$\underline{7x^2 - 15x + 1} \quad 1. \quad \begin{array}{l} 1 + 2x^2 - 5x(3 - x) \\ 1 + 2x^2 - 15x + 5x^2 \\ 7x^2 - 15x + 1 \end{array}$$

$$\underline{(3x - 4)^*} \quad 2. \quad \begin{array}{l} (2x + 5)(\boxed{}x + \boxed{}) = 6x^2 + 7x - 20 \\ (2x)(\boxed{}x) = 6x^2 \text{ and } (5)(\boxed{}) = -20; (2x)(\boxed{3}x) = 6x^2 \text{ and } (5)(\boxed{-4}) = -20 \\ (2x + 5)(\boxed{3}x + \boxed{-4}) = 6x^2 + 7x - 20 \end{array}$$

*accept with or without parentheses

$$\underline{(3, 11)} \quad 3. \quad \begin{array}{l} \text{Line A: } y = -\frac{1}{3}x + 12; \text{ Line B: } y = 3x + 2 \\ -\frac{1}{3}x + 12 = 3x + 2; 10 = 3\frac{1}{3}x; 3 = x \\ y = -\frac{1}{3}(3) + 12 = 11; y = 3(3) + 2 = 11 \end{array}$$

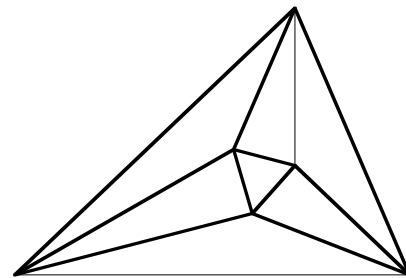
$$\underline{6 \text{ in.}} \quad 4. \quad \frac{1}{3}(b^2)(10) = 120; \frac{10}{3}(b^2) = 120; \frac{10}{3}(b^2) = 120; b^2 = 36; b = 6$$

$$\underline{161.28 \text{ in.}^2} \quad 5. \quad \begin{array}{l} 3^2 + 10^2 = (\text{slant height})^2; 9 + 100 = (\text{slant height})^2; \sqrt{109} = \text{slant height} \\ 3\sqrt{109} = \text{area of each face}; 12\sqrt{109} = \text{area of all 4 faces}; 36 = \text{area of base} \\ 12(10.44) + 36 = 125.28 + 36 = \mathbf{161.28} \end{array}$$

Meet 5 – Event B 2014-2015

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

NO CALCULATORS ALLOWED



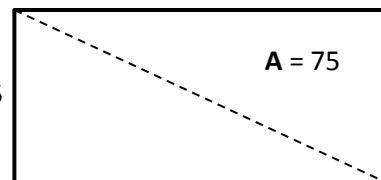
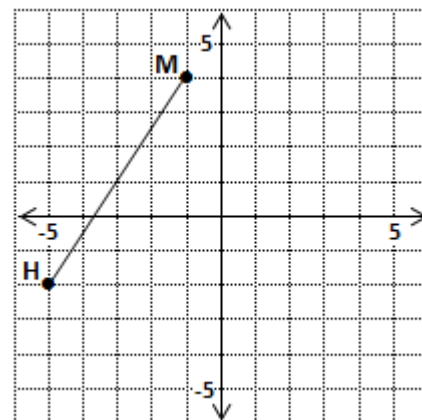
_____ 1A. Line segment MH is rotated 180° about the origin to create segment M'H'.

- _____ 1B. A) Where is M'?
B) Where is H'?

_____ in. 2. A cube has a volume of 729 cubic inches. What is the length, in inches, of each edge?

_____ units 3. The rectangle has a width of 5 units and an area of 75 square units. What is the length of the diagonal of the rectangle, in units?

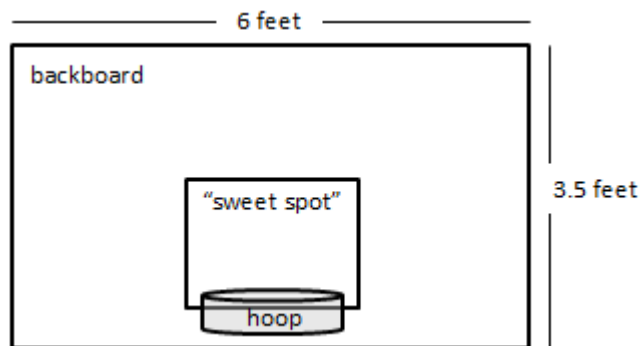
Write your answer as a simplified radical expression.



Use the following information to answer questions 4 and 5.

Sanjay is making a basketball backboard and hoop out of a 3.5×6 foot sheet of plywood and a sliced cylindrical tin, as shown.

_____ in. 4. The basketball Sanjay will use is a sphere with a volume of $\frac{256}{3}\pi$ cubic inches. In order for the ball to fit through the hoop, what must be true about the circumference (C), in inches, of the cylindrical tin?



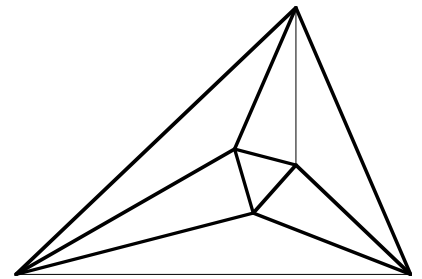
Write your answer as an inequality in terms of C and π .

_____ ft 5. Sanjay will use tape to outline the rectangular "sweet spot." The height of the "sweet spot" is $\frac{3}{4}$ its length. The ratio of the area of the "sweet spot" to the area of the backboard is 1:7. How many feet of tape will Sanjay need?

Meet 5 – Event B 2014-2015

ANSWERS

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



(1, -4)* 1A. M(-1, 4); H(-5, -2)

(5, 2)* 1B. M'(1, -4); H'(5, 2)

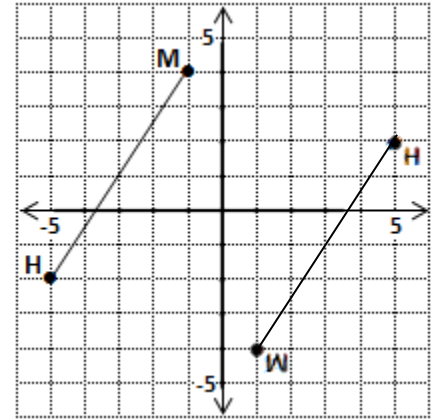
*1 point each; no credit if answers in 1A and 1B are reversed

9 in. 2. $729 = (\text{edge})^3$
 $9 \times 9 \times 9 = 729$; $729 = (9)^3$

$5\sqrt{10}$ units 3. width = 5
length = $75/5 = 15$
 $5^2 + 15^2 = d^2$; $25 + 225 = d^2$; $250 = d^2$
 $d = \sqrt{250} = 5\sqrt{10}$

$C > 8\pi$ in. 4. $V = \frac{4}{3}\pi r^3$; $\frac{256}{3}\pi = \frac{4}{3}\pi r^3$; $\frac{256}{3} \times \frac{3}{4} = r^3$; $64 = r^3$; $4 = r$
Radius of ball is 4 in., thus radius of hoop must be greater than 4 in.
 $C > 2\pi r$; $C > 2\pi(4)$; $C > 8\pi$

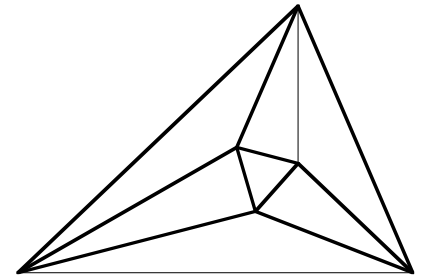
7 ft 5. $A_{(\text{backboard})} = (6)(3.5) = 21 \text{ ft}^2$; $A_{(\text{sweetspot})} = 21/7 = 3 \text{ ft}^2$
 $H_{(\text{sweetspot})} = (3/4)L$; $A_{(\text{sweetspot})} = L \times (3/4)L = 3$; $(3/4)L^2 = 3$; $L^2 = 4$; $L = \underline{2 \text{ ft}}$
 $H_{(\text{sweetspot})} = (3/4)(2) = \underline{3/2 \text{ ft}}$
 $P_{(\text{sweetspot})} = 3/2 + 3/2 + 2 + 2 = \underline{7 \text{ ft}}$



Meet 5 – Team Event 2014-2015

Questions are worth 4 points each.

NO CALCULATORS ALLOWED

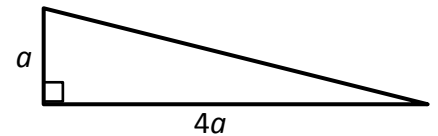


_____ 1. Factor: $x^2 - 18x + 45$

_____ hrs 2. Dylan and Pierre each start playing the same video game at the same time, but on separate devices. Dylan starts at level 6 and completes 3 levels per hour. Pierre starts at level 1 and completes 5 levels per hour. If the boys continue to play at these rates, in how many hours will Dylan and Pierre be playing at the same level?

Use the following information to answer questions 3 and 4.

The diagram shows a right triangle and the dimensions, in units, of its two legs.



_____ sq. units 3. Find the area of the triangle.
Write your answer as a simplified polynomial in terms of a .

_____ units 4. Find the perimeter of the triangle.
Write your answer as a simplified polynomial in terms of a .

Use the following information to answer questions 5 and 6.

There are 8 forks, 10 spoons, and 6 knives in Evelyn's kitchen drawer.

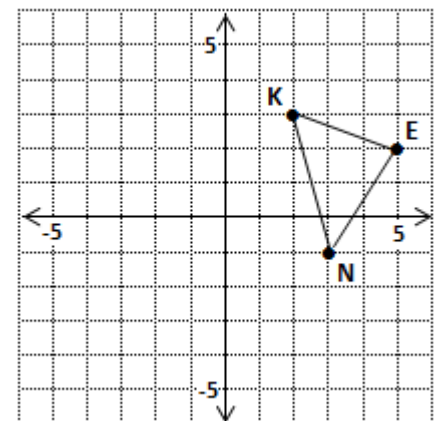
_____ 5. Evelyn will reach into the drawer and pull out one utensil at random. What is the probability that she pulls out a spoon?

_____ 6. How many different combinations of place settings (1 fork, 1 spoon, and 1 knife) can Evelyn make using the utensils in the drawer?

Use the following information to answer questions 7 and 8.

Triangle KEN is graphed on the coordinate plane.

- First, triangle KEN is reflected across the x -axis to create $K'E'N'$.
- Then, triangle $K'E'N'$ is rotated 90° counter-clockwise to create $K''E''N''$.



_____ 7A. Where is E' ?

_____ 7B. Where is N'' ?

_____ units 8. What is the distance, in units, between K and K'' ?
Write your answer as a simplified radical expression.

_____ 9. Simplify: $\frac{x^2+8x+15}{x^2+4x+3}$

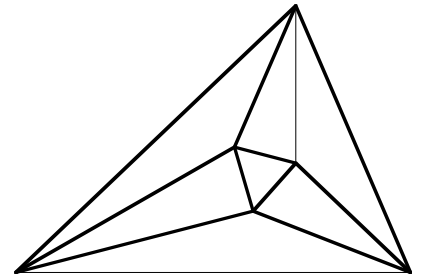
_____ 10. Three vertices of a parallelogram are $(-1, 3)$, $(3, 3)$, and $(3, 1)$. What is the probability that the fourth vertex is located in the second quadrant?

Name _____ School _____

Meet 5 – Team Event 2014-2015

Questions are worth 4 points each.

ANSWERS



$(x - 15)(x - 3)$ 1. $x^2 - 18x + 45$; $x^2 - (3 + 15)x + (3 \times 15)$

2.5 hrs 2. Dylan: $y = 3x + 6$
 Pierre: $y = 5x + 1$
 $3x + 6 = 5x + 1$; $5 = 2x$; $5/2 = x$

$2a^2$ sq. units 3. $\frac{1}{2}(a)(4a) = 2a^2$

$5a + a\sqrt{17}$ units* 4. $a^2 + (4a)^2 = c^2$; $a^2 + 16a^2 = c^2$; $17a^2 = c^2$; $\sqrt{17a^2} = c$; $a\sqrt{17} = c$
 *also accept $a(5 + \sqrt{17})$ P: $a + 4a + a\sqrt{17} = 5a + a\sqrt{17}$

$\frac{5}{12}$ 5. $\frac{10 \text{ spoons}}{(8+10+6) \text{ utensils}} = \frac{5}{12}$
 *also accept 0.416 or 41.6%

480 6. $8 \times 10 \times 6 = 480$

$(5, -2)$ 7A. $E(5, 2)$; $E'(5, -2)$

$(-1, 3)$ 7B. $N(3, -1)$; $N'(3, 1)$; $N''(-1, 3)$
 *2 points each

$\sqrt{2}$ units 8. $K(2, 3)$; $K'(2, -3)$; $K''(3, 2)$
 $d = \sqrt{(2 - 3)^2 + (3 - 2)^2}$; $d = \sqrt{(-1)^2 + 1^2}$; $d = \sqrt{2}$

$\frac{x+5}{x+1}$ 9. $\frac{(x+3)(x+5)}{(x+1)(x+3)} = \frac{x+5}{x+1}$

$2/3$ 10. Of the 3 possible locations for the fourth vertex (circled in diagram), 2 are in the second quadrant.

