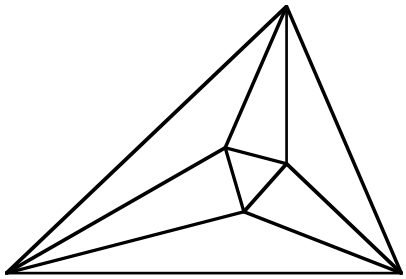
Meet 4 - Event A 2012-2013



Questions are worth 2-2-2-4-4 points respectively.
Remember your units.

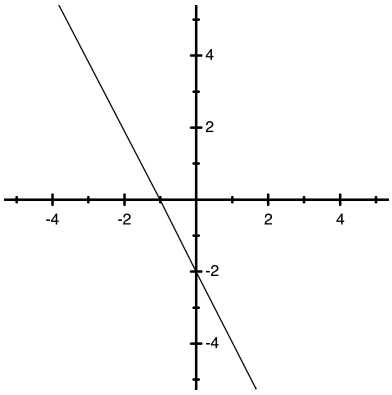
NO CALCULATORS ALLOWED

_____1. Solve for x if $\sqrt{x} = 3\sqrt{5}$.

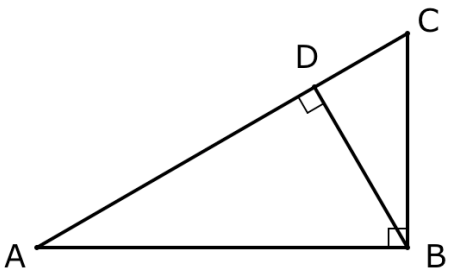
_____2. What is the surface area of a cube with an edge of one half inch? Answer as a ratio of relatively prime numbers.

_____3. Find the x-intercept of $y = 3x - 12$.

_____4. Write the equation of this line in $y = mx + b$ format.

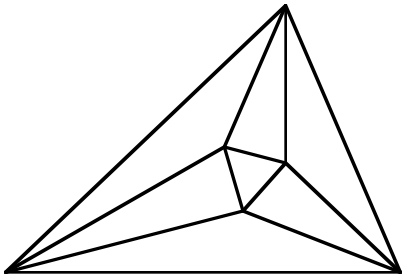


_____5. In right triangle ABC, BD is an altitude. If AC=2" and BC=1", what is the length of DC?



Name_____School_____

Meet 4 - Event A 2012-2013 Answers



Questions are worth 2-2-2-4-4 points respectively.
Remember your units.

45 1. $3\sqrt{5} = \sqrt{9 \bullet 5} = \sqrt{45}$, so $x = 45$

$\frac{3}{2}$ sq. in. or $\frac{3}{2}$ in^2. 2. S.A. $= 6 \bullet \frac{1}{2} \bullet \frac{1}{2} = \frac{3}{2}$ sq. in.

(–1 if wrong or missing units)

4 or (4,0) 3. $0 = 3x - 12, 12 = 3x, x = 4$

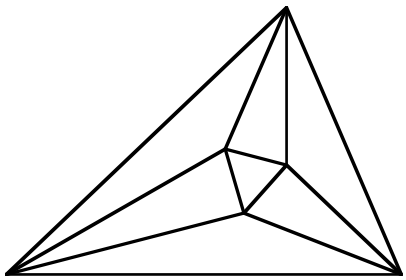
$y = -2x - 2$ 4. The intercepts are $(-1,0)$ and $(0,-2)$, so $m = \frac{-2-0}{0-(-1)} = \frac{-2}{1} = -2$,

$b = -2$, $y = -2x - 2$

$\frac{1}{2}$" or 0.5" 5. $\triangle ABC \sim \triangle BDC$, so $\frac{BC}{AC} = \frac{DC}{BC}$, $\frac{1}{2} = \frac{x}{1}$, $x = \frac{1}{2}$"

(–1 if no units)

Meet 4 - Event B 2012-2013



Questions are worth 2-2-2-4-4 points respectively.
Remember your units.

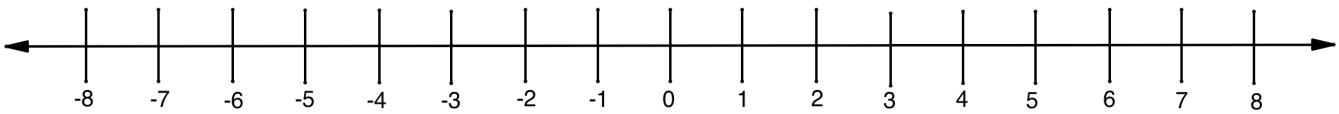
NO CALCULATORS ALLOWED

_____1. Solve for *x*: $3(x-1) < {}^{-}27$.

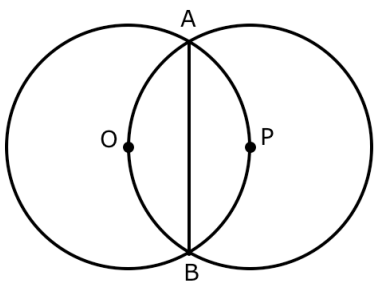
_____2. Solve for *x*: ${}^{-}5x > 25$.

_____3. Simplify: $\sqrt{9800}$.

4. Graph all possible *x* values for $|x-3| \le 2$:



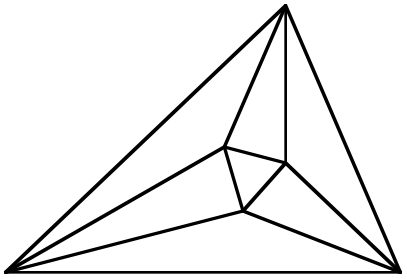
_____5. Circles *O* and *P*, each with a radius of 2 cm, intersect at *A* and *B* and pass through each other's center. What is the length of *AB*, in simplified radical form?



Name_____School_____

Meet 4 - Event B 2012-2013

Answers



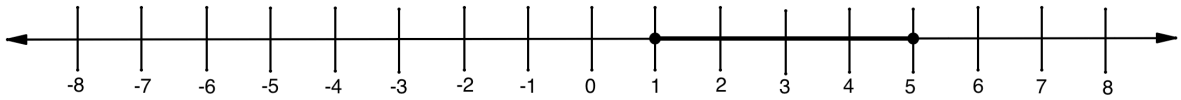
Questions are worth 2-2-2-4-4 points respectively.
Remember your units.

$x < -8$ 1. $3x - 3 < -27, \quad 3x < -24, \quad x < -8$

$x < -5$ 2. $\frac{-5x}{-5} > \frac{25}{-5}, \quad x < -5$

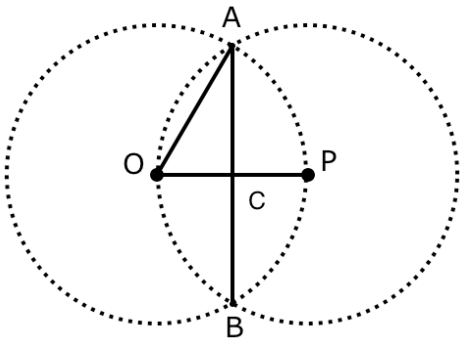
$70\sqrt{2}$ 3. $\sqrt{2 \bullet 4900} = 70\sqrt{2}$

4. $x - 3 \le 2, x \le 5$ and $x - 3 \ge -2, x \ge 1$

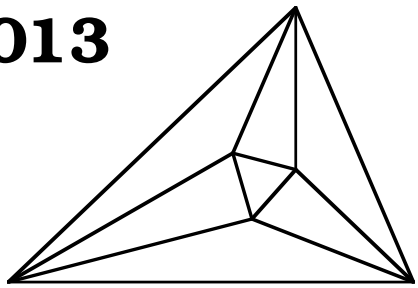


(must be a line segment, not just the integers)

$2\sqrt{3}$ cm
(−1 if no units) 5. Draw *OP* and *OA*. *OP*=*OA*=2cm, so by symmetry, *OC*=1cm and $\triangle AOC$ is a right triangle. $AC = \sqrt{4-1} = \sqrt{3}$ so $AB = 2\sqrt{3}$.

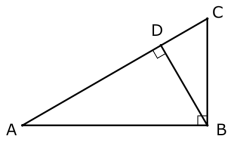


Meet 4 - Team Event 2012-2013

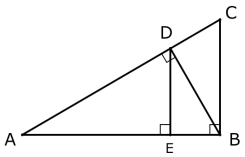


Questions are worth 4 points each.
Remember your units.

NO CALCULATORS ALLOWED



_____1. In right triangle *ABC*, *BD* is an altitude. If *AC*=2" and *BC*=1", what is the length of *BD*?



_____2. In problem 1, if *DE* is an altitude in $\triangle ABD$, then what is the length of *DE*?

_____3. What is the area of the triangle formed by $y = 4, x = -2$ and $y = 3x - 8$?

_____4. What is the area of the triangle formed by $x = -3$, $y = \frac{1}{3}x - 2$ and $y = -3x + 8$?

_____5. Solve for *x* as a ratio of relatively prime numbers: $4(2 - x) > 3(x - 1)$.

_____6. Write as an inequality: *x* is at most three.

_____7. What is the surface area of a cylinder with a circumference of 10π in., and a height of 8 in.? Answer in terms of π.

_____8. If a square pyramid has a surface area of 64cm^2 and the base has an edge of 4cm, what is the area of one triangle in the lateral area of the pyramid?

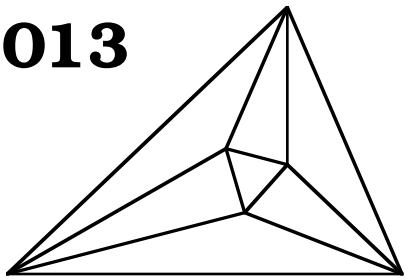
_____9. What is the area of triangle *ABC* with vertices at *A*(0, 0), *B*(6, 0), and *C*(10, 4)?

_____10. What is the perimeter of the triangle in problem 9? Answer in simplest radical form.

 School_____

Meet 4 - Team Event 2012-2013

Answers



Questions are worth 4 points each.
Remember your units.

$\frac{\sqrt{3}}{2}$ in.

1. If $AC = 2", BC = 1"$, then $AB = \sqrt{4-1} = \sqrt{3}"$. $\triangle ABC \sim \triangle BDC$ so $\frac{AB}{AC} = \frac{BD}{BC}, \frac{\sqrt{3}}{2} = \frac{x}{1}, \quad x = \frac{\sqrt{3}}{2}"$

$\frac{3}{4}"$ or $0.75"$

2. $\triangle ABC \sim \triangle BDC$, so $DC = \frac{1}{2}", AD = 2 - \frac{1}{2} = \frac{3}{2} = 1.5,$
$\triangle ABC \sim \triangle AED$, so $\frac{AC}{BC} = \frac{AD}{DE}, \frac{2}{1} = \frac{1.5}{x}, x = \frac{1.5}{2} = 0.75"$

54units^2
$(-1 \text{ if no units}^2)$

3. When $y = 4, 4 = 3x - 8, 12 = 3x, x = 4$ and when $x = -2, y = 3(-2) - 8, y = -14$, so the vertices are at $(-2,4), (4,4)$ and $(-2,-14)$. Base$= 4 - {}^{-}2 = 6$,
Height$= 4 - {}^{-}14 = 18$, Area$= \frac{1}{2} \bullet 6 \bullet 18 = 54$

60 units^2
$(-1 \text{ if no units}^2)$

4. $\frac{1}{3} \bullet {}^{-}3 = {}^{-}1$ so $y = -3x + 8$ and $y = \frac{1}{3}x - 2$ are perpendicular at $(3, {}^{-}1)$, since $-3x + 8 = \frac{1}{3}x - 2, \frac{10}{3}x = 10, x = 3$ and $y = = \frac{1}{3} \bullet 3 - 2 = -1$. The hypotenuse on $x = {}^{-}3$ intersects the lines at $(-3,17)$ and $(-3,-3)$. The base is $\sqrt{(3 - {}^{-}3)^2 + (-1 - {}^{-}3)^2} = \sqrt{36+4} = \sqrt{40} = 2\sqrt{10}$. The height is $\sqrt{(17 - {}^{-}1)^2 + (-3-3)^2} = \sqrt{18^2 + 6^2} = \sqrt{360} = 6\sqrt{10}$. $A = \frac{1}{2} \bullet 2\sqrt{10} \bullet 6\sqrt{10} = 6 \bullet 10 = 60$

$x < \frac{11}{7}$

5. $8 - 4x > 3x - 3, 8 - 7x > {}^{-}3, {}^{-}7x > {}^{-}11, x < \frac{11}{7}$

$x \le 3$

6. "at most" means 3 or less

130π sq.in.
(or 130π in.^{2})

7. If $C = 10\pi, r = 5$ and $A = 25\pi$ for one circle.
$S.A. = 2(25\pi) + 10\pi \bullet 8 = 50\pi + 80\pi = 130\pi$

12 cm^2

8. The base area is $4 \bullet 4 = 16\text{cm}^2$, so the lateral area is $64 - 16 = 48\text{cm}^2$. There are four triangles in the pyramid, so $48 \div 4 = 12\text{cm}^2$.

12 units^2
$(-1 \text{ if no units}^2)$

9. The base on the x-axis is 6 and the height from the y-axis to (10, 4) is 4, so $\frac{1}{2} \bullet 6 \bullet 4 = 12$

$(6 + 4\sqrt{2} + 2\sqrt{29})$ units
(-1 if no units)

10. $AB = 6, BC = \sqrt{(10-6)^2 + (4-0)^2} = \sqrt{16+16} = \sqrt{32} = 4\sqrt{2}$,
$AC = \sqrt{10^2 + 4^2} = \sqrt{100+16} = \sqrt{116} = 2\sqrt{29}$