

Geometry: EOC Prep

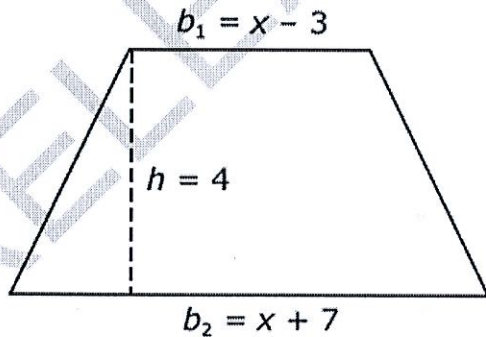
Spring 2013

Name: Key!

Directions: The following questions are sample items similar to those found on the EOC Exam. Answer each to the best of your ability.



1. The area of a trapezoid is found using the formula $A = \frac{1}{2}h(b_1 + b_2)$, where A is the area, h is the height, and b_1 and b_2 are the lengths of the bases.



What is the area of the above trapezoid?

- A $A = 4x + 2$
 B $A = 4x + 8$
 C $A = 2x^2 + 4x - 21$
 D $A = 2x^2 + 8x - 42$

$$A = \frac{4(x-3+x+7)}{2}$$

$$A = \frac{4(2x+4)}{2}$$

$$A = 2(2x+4)$$

$$A = 4x+8$$

2. What is the sum of $-3x^2 - 7x + 9$ and $-5x^2 + 6x - 4$?

① $-8x^2 - x + 5$

(3) $-8x^2 - 13x + 13$

(2) $-8x^4 - x + 5$

(4) $-8x^4 - 13x^2 + 13$

$$-3x^2 - 7x + 9 + -5x^2 + 6x - 4$$

$$-8x^2 - 1x + 5$$

3. Which expression is equivalent to $(3x^5 + 17x^3 - 1) + (-2x^5 - 6)$?

Ⓐ $x^5 + 17x^3 - 7$

B $x^5 - 11x^3 - 1$

C $5x^5 + 17x^3 + 7$

D $-6x^5 + 17x^3 + 6$

$$3x^5 + 17x^3 - 1 - 2x^5 - 6$$

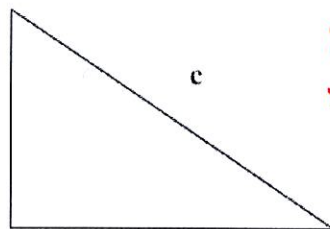
$$\underline{3x^5 - 2x^5} + \underline{17x^3 - 1 - 6}$$

$$1x^5 + 17x^3 - 7$$

4. Find the length of the missing side of the triangle below.

Perimeter = $x^2 + 5x + 11$ cm

Height(h): $2x - 4$ cm



Base(b): $3x - 5$ cm

$$P = h + b + c$$

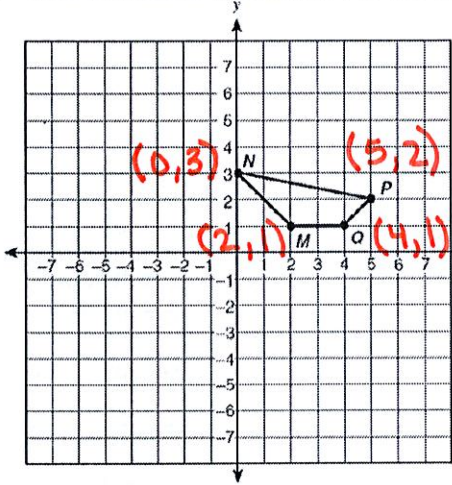
$$x^2 + 5x + 11 = 2x - 4 + 3x - 5 + c$$

$$x^2 + \cancel{5x} + 11 = \cancel{5x} - 9 + c$$

$$\underline{-5x + 9} \quad \underline{-5x + 9}$$

$$x^2 + 20 = c$$

5. Approximate the length of the perimeter of the quadrilateral below.



$$\overline{MN} = \sqrt{(2-0)^2 + (1-3)^2} = \sqrt{2^2 + (-2)^2} = \sqrt{4+4} = \sqrt{8}$$

$$\overline{MO} = 2$$

$$\overline{OP} = \sqrt{(5-4)^2 + (2-1)^2} = \sqrt{1^2 + 1^2} = \sqrt{2}$$

$$\overline{NP} = \sqrt{(5-0)^2 + (2-3)^2} = \sqrt{5^2 + (-1)^2} = \sqrt{25+1} = \sqrt{26}$$

$$\sqrt{8} = 2.8$$

$$2.8 + 1.4 + 5.1 + 2$$

$$\sqrt{2} = 1.4$$

$$= 11.3$$

$$\sqrt{26} = 5.1$$



1	1	3		
.	/	√	π	⊞
0	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

Silvia worked in a store that sold cylinder-shaped children's pools. She made a sign relating the volumes of these two pools.

$$V = \pi(6^2)(3)$$

$$V = 108\pi$$

$$V = 339.12$$

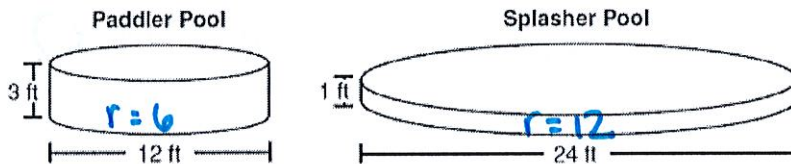
The Splasher Pool holds 2 percent of the water the Paddler Pool holds.

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

$$V = \pi(12)^2(1)$$

$$V = 144\pi$$

$$V = 452.16$$



The volume of the Paddler Pool is 108π cubic feet.

The Splasher Pool holds which percent of the water the Paddler Pool holds?

- A. 33%
- B. 75%
- C. 133%
- D. 300%

$$\frac{\text{Splasher}}{\text{Paddler}} = \frac{144\pi}{108\pi} = \frac{144}{108} = 1.3 \times 100 = 133\%$$

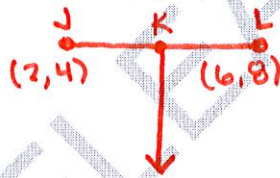
6. A line segment has endpoints $J(2, 4)$ and $L(6, 8)$. The point K is the midpoint of \overline{JL} . What is an equation of a line perpendicular to \overline{JL} and passing through K ?

A. $y = -x + 10$

B. $y = -x - 10$

C. $y = x + 2$

D. $y = x - 2$



$$x_k = \frac{2+6}{2} = \frac{8}{2} = 4$$

$$y_k = \frac{4+8}{2} = \frac{12}{2} = 6$$

$$K(4, 6)$$

$$m = \frac{8-4}{6-2} = \frac{4}{4} = 1$$

$$\perp m = -1$$

$$y = mx + b$$

$$6 = -1(4) + b$$

$$6 = -4 + b$$

$$10 = b$$

$$y = -x + 10$$

$$P = 6.1 + 3.6 + 4.5 = 14.2$$

7. A triangle has vertices at $(1, 3)$, $(2, -3)$, and $(-1, -1)$. What is the **approximate** perimeter of the triangle?

- A 10
- B 14
- C 15
- D 16

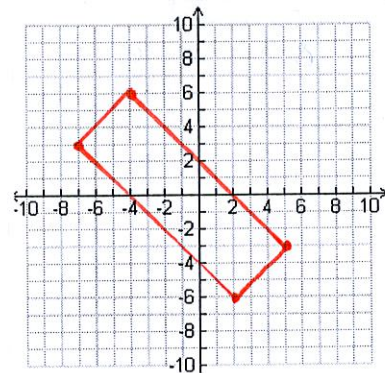
$$\begin{aligned} \overline{AB} &= \sqrt{(2-1)^2 + (-3-3)^2} \\ &= \sqrt{1^2 + (-6)^2} \\ &= \sqrt{1+36} = \sqrt{37} \\ &= 6.1 \end{aligned}$$

$$\begin{aligned} \overline{BC} &= \sqrt{(-1-2)^2 + (-1+3)^2} \\ &= \sqrt{(-3)^2 + 2^2} \\ &= \sqrt{9+4} = \sqrt{13} \\ &= 3.6 \end{aligned}$$

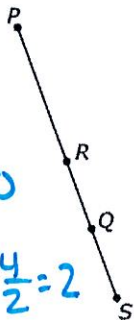
$$\begin{aligned} \overline{AC} &= \sqrt{(-1-1)^2 + (-1-3)^2} \\ &= \sqrt{(-2)^2 + (-4)^2} \\ &= \sqrt{4+16} = \sqrt{20} \\ &= 4.5 \end{aligned}$$

8. The vertices of quadrilateral $EFGH$ are $E(-7, 3)$, $F(-4, 6)$, $G(5, -3)$, and $H(2, -6)$. What kind of quadrilateral is $EFGH$?

- A trapezoid
- B square
- C rectangle that is not a square
- D rhombus that is not a square



9. R is the midpoint of segment PS . Q is the midpoint of segment RS .



P is located at $(8, 10)$, and S is located at $(12, -6)$. What are the coordinates of Q ?

- A $(4, 2)$
- B $(2, -8)$
- C $(11, -2)$
- D $(10, 2)$

$$R(10, 2)$$

$$S(12, -6)$$

$Q = \text{middle}$

$$x_Q = \frac{10+12}{2} = \frac{22}{2} = 11$$

$$y_Q = \frac{2-6}{2} = -\frac{4}{2} = -2$$

$$Q(11, -2)$$

$$\begin{aligned} x_R &= \frac{8+12}{2} \\ &= \frac{20}{2} = 10 \end{aligned}$$

$$y_R = \frac{10-6}{2} = \frac{4}{2} = 2$$

10. County X has a population density of 250 people per square mile. The total population of the county is 150,000. Which geometric model could be the shape of county X?

$$\begin{aligned} a^2 + b^2 &= c^2 \\ 30^2 + b^2 &= 50^2 \\ 900 + b^2 &= 2500 \\ b^2 &= 1600 \\ b &= 40 \end{aligned}$$

- A a parallelogram with a base of 25 miles and a height of 25 miles $A = bh = 650 \times 250 = 156250$
- B a rectangle that is 15 miles long and 45 miles wide $A = LW = 15 \times 45 = 675 \times 250 = 168750$
- C a right triangle with a leg that is 30 miles long and a hypotenuse that is 50 miles long $A = \frac{1}{2}bh = \frac{(30)(40)}{2} = 600 \times 250 = 150000$
- D a trapezoid with base lengths of 10 miles and 30 miles and a height of 25 miles

11. A company is designing a cylinder to hold marbles for a new game it is inventing. The cylinder has a height of 18 inches and a diameter of 6 inches. Find the volume of the cylinder to the *nearest tenth* of a cubic inch.

$$\begin{aligned} V &= \pi r^2 h \\ d &= 2r \\ b &= 2r \\ r &= 3 \\ V &= (3.14)(3^2)(18) \\ V &= 508.68 \end{aligned}$$

- [1] 108.0
- [2] 508.9
- [3] 678.6
- [4] 1065.92

12. A line segment has endpoints $J(2, 4)$ and $L(6, 8)$. The point K is the midpoint of \overline{JL} . What is an equation of a line perpendicular to \overline{JL} and passing through K ?

- A $y = -x + 10$
- B $y = -x - 10$
- C $y = x + 2$
- D $y = x - 2$

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