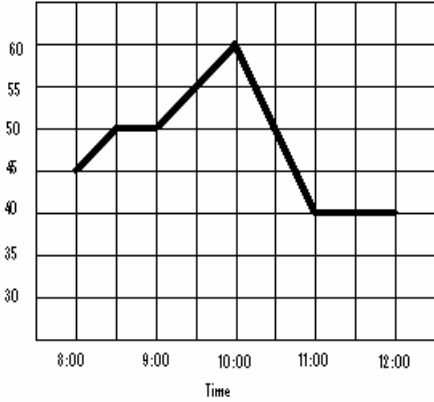
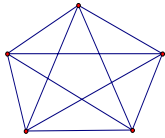
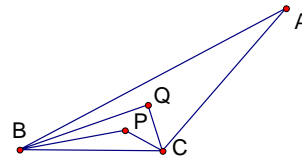
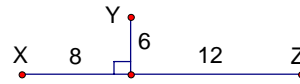
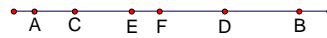


1. Pablo's Pizza Place sells a 6-inch diameter pizza for \$5, an 8-inch diameter pizza for \$7, and a 10-inch diameter pizza for \$10. Which is the best buy?	1.													
2. For what percent of the time was Eric driving at 50 miles per hour or slower?	2.													
3. What was Eric's average speed , in miles per hour, between 8:30 and 10:30?	3.													
<p>Speeds (miles per hour) at which Eric drove</p>  <table border="1" style="margin: 10px auto;"> <caption>Speeds (miles per hour) at which Eric drove</caption> <thead> <tr> <th>Time</th> <th>Speed (mph)</th> </tr> </thead> <tbody> <tr><td>8:00</td><td>45</td></tr> <tr><td>8:30</td><td>50</td></tr> <tr><td>9:00</td><td>50</td></tr> <tr><td>10:00</td><td>60</td></tr> <tr><td>11:00</td><td>40</td></tr> <tr><td>12:00</td><td>40</td></tr> </tbody> </table>	Time	Speed (mph)	8:00	45	8:30	50	9:00	50	10:00	60	11:00	40	12:00	40
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8:00	45													
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4. How many different triangles are in this figure?	4.													
														
5. We will define $a * b = 3a^2 - b$. Evaluate $4 * (3 * -5)$.	5.													
6. How many positive two-digit numbers are increased by exactly 9 when the digits are reversed?	6.													
7. What number should be removed from the list 17, 19, 21, 23, 25, ..., 97, 99 so that the average of the remaining numbers is 59?	7.													
8. A regular polygon has sides of length 3 units and an exterior angle of 24° . What is the perimeter of the polygon?	8.													
9. What is the least possible positive integer with no odd digits that is divisible by 9?	9.													
10. If $n = 0.9999\dots999$ has 2005 digits to the right of the decimal point, each a 9, what is the 2005 th digit to the right of the decimal point of \sqrt{n} ?	10.													
11. A watermelon is 95% water by weight. A watermelon that originally weighed 45 pounds is left in the sun until it weighs only 30 pounds. What percent water is it now?	11.													
12. In the following equation, $\frac{a}{b}$ is a common fraction. What is the value of $a + b$?	12.													
$\frac{a}{b} = \frac{1}{3 + \frac{1}{1 + \frac{1}{5}}}$														

<p>13. Alex runs at a constant rate of 6 miles per hour. Black runs at a constant rate of 8 miles per hour. Crain runs at a constant rate of 9 miles per hour. In a relay race with these three runners as a team running one right after another, Alex runs 0.3 miles, Black runs 0.4 miles, and Crain runs 0.5 miles. What is the team's average speed in miles per hour?</p>	<p>13.</p>
<p>14. A videotape can record 2 hours on short play, 4 hours on long play, or 6 hours on extra long play. After recording for 30 minutes on long play and 45 minutes on short play, how many minutes can it record on extra long play?</p>	<p>14.</p>
<p>15. What is the area of the circle that passes through X, Y, and Z?</p>	<p>15.</p>
<p>16. The trisectors of two angles of scalene $\triangle ABC$ meet at points P and Q as shown. The third angle of the triangle, $\angle A$, measures 30°. Find the number of degrees in $m\angle BPC$.</p>	<p>16.</p>
<p>17. How many ordered triples (a, b, c) have the property that each number is the product of the other two?</p>	<p>17.</p>
<p>18. Write as a common fraction or mixed number: $\left(\frac{1}{2}\right)^1 + \left(\frac{1}{2}\right)^2 + \left(\frac{1}{2}\right)^3 + \cdots + \left(\frac{1}{2}\right)^8$</p>	<p>18.</p>
<p>19. On a 60-question test, 36 questions involve algebra and 12 questions are difficult. If 5 of the difficult questions involve algebra, how many of the questions that are not difficult do not involve algebra?</p>	<p>19.</p>
<p>20. How many cards must you draw from a deck of 52 cards to be certain that you have at least 6 of the same color if the deck has 13 blue, 13 green, 13 red, and 13 white cards?</p>	<p>20.</p>
<p>21. The arithmetic mean of 20 numbers is what percent of the sum of the same 20 numbers?</p>	<p>21.</p>
<p>22. A point (x, y) is randomly picked from inside the rectangle with vertices at (0, 0), (5, 0), (5, 1), and (0, 1). What is the probability that $x > 2y$?</p>	<p>22.</p>
<p>23. The n^{th} term of a sequence is $a_n = (-1)^{n+1}(2n+3)$. What is the value of $a_1 + a_2 + a_3 + \cdots + a_{100}$?</p>	<p>23.</p>
<p>24. $\triangle ABC$ has perimeter 2005 and the sides have lengths that are all integers, with $AB < BC \leq AC$. What is the difference between the largest possible value of AB and the smallest possible value of AB?</p>	<p>24.</p>



<p>25. If $-5 \leq a \leq -1$ and $1 \leq b \leq 3$, what is the smallest possible value of $\left(\frac{1}{a} + \frac{1}{b}\right)\left(\frac{1}{b} - \frac{1}{a}\right)$?</p>	25.
<p>26. Find the smallest integer $n > 1$ so that the units digit of d^n is the same as the units digit of d for all positive integers d.</p>	26.
<p>27. If an arc of 45° on circle A has the same length as an arc of 36° on circle B, what is the ratio of the area of circle A to the area of circle B?</p>	27.
<p>28. The sequence 2, 3, 5, 6, 7, 10, 11, 12, 13, 14, 15, 17, ... consists of all positive integers that are not squares or cubes. What is the 500th term of the sequence?</p>	28.
<p>29. Name the segment represented by the expression $\left[\overline{AE} \cup \left(\overline{EF} \cap \overline{CD}\right)\right] \cap \left[\left(\overline{AD} \cap \overline{CE}\right) \cup \overline{AB}\right]$.</p>	29.
<p>30. Two positive integers are called <i>reversible</i> if the digits of one of the integers, when written in reverse order, are the digits of the other integer (i.e. 63 and 36). What are <u>two</u> reversible numbers whose product is 394695?</p>	30.



Tie-breaker: (Show your work and give an explanation of your answer.)

Assume $a > 0$, $b > 0$ (a) Show that if $a < b$, then $a^2 < b^2$ and (b) Show that if $a^2 < b^2$, then $a < b$