

6. A rectangle of paper is said to be size A0 if it has an area of 1 square meter and the ratio of the long side to the short side is exactly the same as the ratio of the long to the short side of the rectangle that results from cutting the paper in half with a cut perpendicular to the longer side. When A0 paper is cut in half this way, it is called A1 paper. Similarly, A2 paper is obtained from A1 paper, but cutting it in half with a cut perpendicular to the long side of the rectangular page. Continuing in this way, one obtains A3 paper, A4 paper, etc. What is the perimeter of A4 paper?

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a. $\frac{2\sqrt[4]{2} + \sqrt[4]{8}}{4}$ m b. $\frac{1 + \sqrt{5}}{3}$ m c. $\frac{2\sqrt[4]{2} + \sqrt{5}}{4}$ m d. $\frac{\sqrt{2} + 1}{2\sqrt[4]{2}}$ m e. $\frac{1 + \sqrt[4]{2} + \sqrt{5}}{3\sqrt{2}}$ m multure ## # 13 PK 7. Find the largest integer n for which $\frac{40!}{2^n}$ is an integer. b. 20 a. 38 c. 32 d. 40 e. 24

8. Which of the following statements hold regarding conic sections and their foci?

I. The foci of an ellipse must *always* lie on the minor axis of the ellipse.

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II. In a hyperbola, the difference of the distances between any point on the hyperbola and the two foci is a constant.

III. The sum of the distances from any point on an ellipse to its foci is the length of the b. III only c. I and II only s the major axis.

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9. A positive integer is said to be a palindromic number if it is equal to itself when its digits are reversed. Let P_2, P_3, P_4, \ldots denote the number of palindromic numbers with two digits, three digits, four digits, and so on. What is true regarding the following sequence of ratios?

 $\frac{P_3}{P_2}, \frac{P_4}{P_3}, \frac{P_5}{P_4}, \frac{P_6}{P_5}, \dots$

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a. The sequence always increases.

b. The sequence always decreases.

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c. The sequence is constant.

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d. The sequence is composed of a finite number of values that neither increase nor always decrease.

e. The sequence is composed of an infinite number of values that neither increase nor always decrease.

mistille # # 10. At Heidi High everyone in the chess club is in the math club. Half of the people in the engineering club are in the math club. One third of the math club members are also in the chess club. Exactly half of the chess club also belong to the engineering club. Half as many students are in all three clubs as there are in just the engineering club. If there are δ_{i} 60 members in the engineering club, how many students are in at least one of these three clubs?

d. 90 a.75 b. 120 c. 135 e. 100

11. Find 2x + 3y given that x + y = 6 and $x^2 + 3xy + 2y^2 = 60$. d. 20 a.14 b. 22 c. 18

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e. None of these

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物水 12. Mary is very superstitious about playing poker, especially when she and Frances are the only ones playing. They always use a standard 52-card deck. Mary never looks at her last card until it's time to see who wins. Frances shows her hand of $9\clubsuit, 9\diamondsuit, 9\diamondsuit, 2\heartsuit, 5\heartsuit$ while Mary glances at her first four cards: $A\diamondsuit, 2\diamondsuit, 3\diamondsuit, 4\diamondsuit$. In order to win, Mary's fifth card must be a 5 or any diamond. What is the probability that Mary wins? 物於

c. $\frac{10}{43}$

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13. In the Grantwood subdivision all homes have identical lawns. Three friends decide to start a lawn-mowing service on Saturdays to make some extra spending money. Working together it takes them 3 hours to mow 6 lawns. Next Saturday they have to mow 21 lawns, so they've invited four friends to join them. If every helper works at the same rate and they begin working at 9:00 AM, when will they finish all these lawns?

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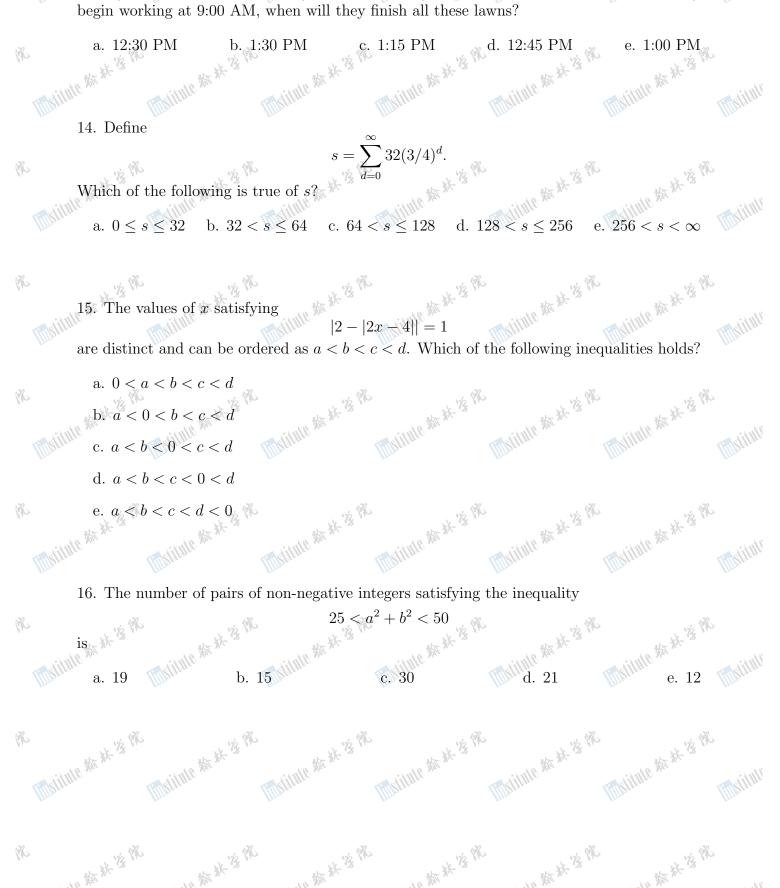
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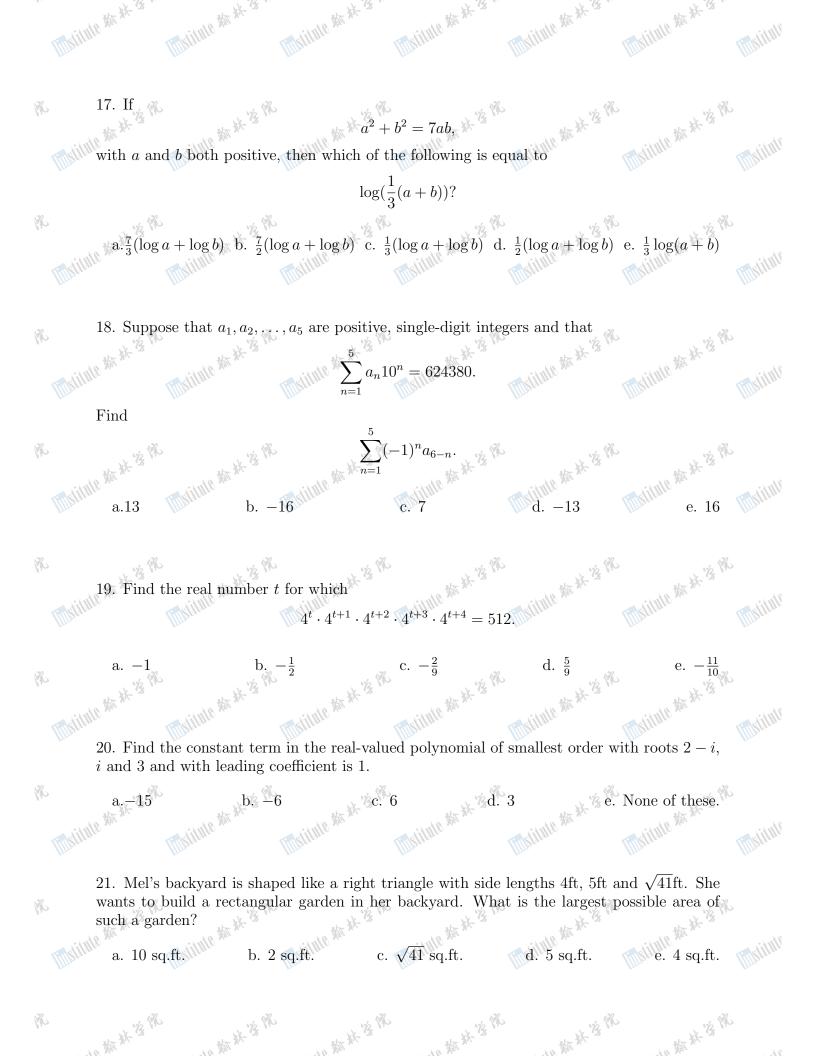
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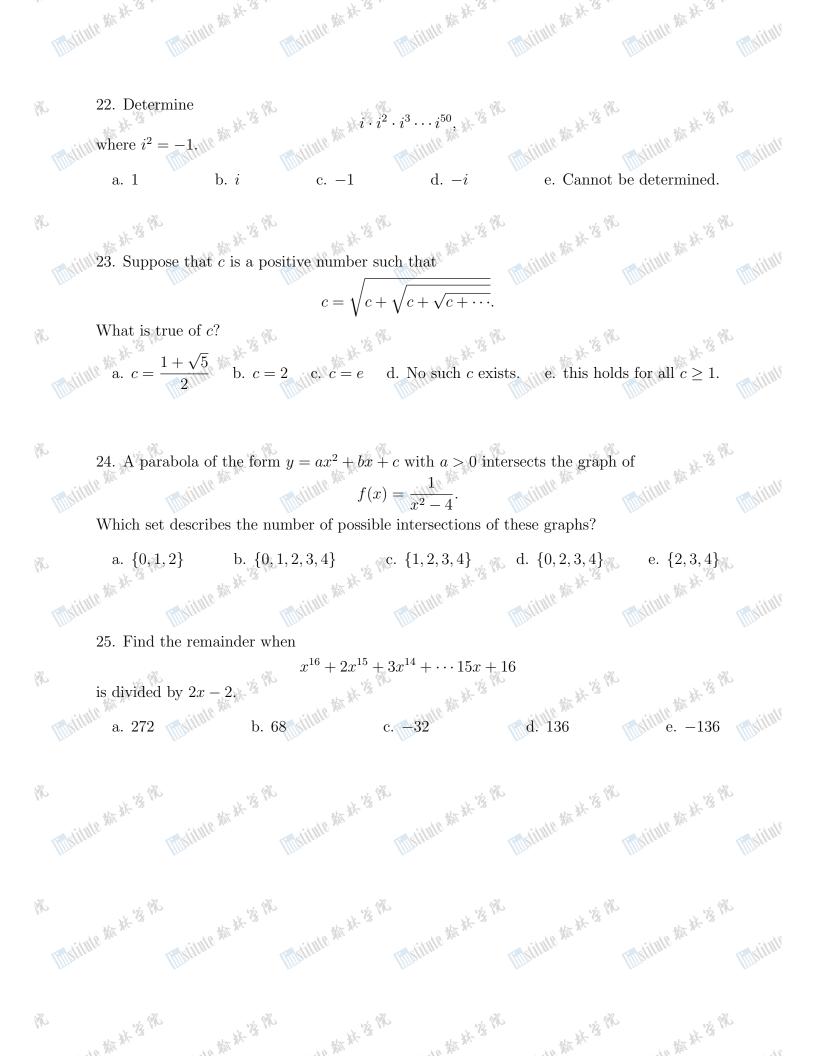
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multitute # # '3 # $f(x) = \frac{5x-2}{x+4}$ has an inverse that can be written in the form $f^{-1}(x) = \frac{x+b}{cx+d}$. Find d. a. $\frac{3}{4}$ b. -3 $f(x) = \frac{3x-2}{x+4}$ 26. The function Astitute ## #

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a stitute # # # # matine ## # B Maritute # # 'S R 面的机机就带样等除 Distitute ## # '\$ Astitute the the 27. Over the next three years BigCorp Holdings plans to cut its workforce by 13% from its current value. To make the transition easier, the boss wants to layoff p percent of the workforce this year; next year p + 1 percent of the remaining workforce will be laid off and the year after that p+2 of the remaining workforce will be laid off. If x denotes the percent (as a decimal) that should be laid off in the first year, which of the following equations hold for x?

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a.
$$x(x+1)(x+2) = 13$$

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a. 12

b.
$$x(x-1)(x-2) = 87$$

c. $x(x+0.01)(x+0.02) = .13$
d. $3x + 0.03 = .13$

e.
$$(1-x)(.99-x)(0.98-x) = .87$$

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Multille # # # # 训册称林谱院 加加斯林道際 28. The equation of the line through the vertex of $y = x^2 - 14x + 51$ and perpendicular to . A ⊣ d. −19 Mainte # # 3 % the line through the origin and (4,3) has the form Ax + By = 34. Find A + B. mailule # # 18 C. 29

· 13. 8%

b.K-6 matitute #### # matitute # # '3 而如此此教林塔 29. Jose earned \$150 during his first week at his summer job. He decided to spend it all at the electronics store. He bought some CDs for \$10 each, some discount DVDs at \$7 each and some blank writable DVDs for \$0.50 each. He bought exactly 100 items and spent all 物状的 his money (assume there is no sales tax). How many discount DVDs did he buy?



