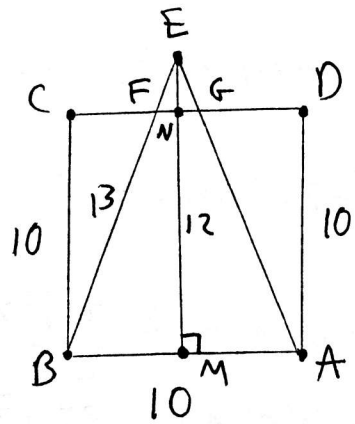
**12 D**




$\triangle AME$ IS A 5-12-13 RIGHT TRIANGLE

$EN = 2$

QUESTION: AREA TRAPEZOID ABFG

$=$ AREA $\triangle ABE$ $-$ AREA $\triangle GFE$.

AREA $\triangle ABE = \frac{1}{2} \cdot 10 \cdot 12 = 60$

$\triangle ABE$ IS SIMILAR TO $\triangle GFE$

SO $\dfrac{\text{AREA } \triangle GFE}{\text{AREA } \triangle ABE} = \dfrac{EN^2}{EM^2} = \dfrac{2^2}{12^2} = \dfrac{1}{36}$, SO AREA $\triangle GFE = \frac{1}{36} \times 60 = \frac{5}{3}$

SO AREA TRAP. ABFG $= 60 - \frac{5}{3} = \frac{175}{3}$ ANS. D.

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**13 A**

TRICK: LET $x = 25^y$ SO $\log_{25} x = y$, $x^{\log_{25} 9} = 9^y$

$9^{\log_{25} x} = 9^y$, THE EQUATION GIVES $9^y + 9^y = 54$

$9^y = 27$, $y = \frac{3}{2}$ SO $x = 125$, ANS A IS THE ONLY

POLYNOMIAL WITH 125 AS ONE ROOT, ALL ROOTS OF B-E ARE

IN THE SET $\{\pm 1, \pm 5, \pm 25\}$.

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**14 A**

PROBABILITY $= \dfrac{n(E)}{n(S)} = \dfrac{{}_8C_4 \cdot {}_4C_1 \cdot 2^3}{{}_{16}C_5}$, ${}_nC_r = \dfrac{n!}{r!(n-r)!}$,

ONE WAY TO INTERPRET THE NUMERATOR IS CHOOSE 4 OF THE EIGHT PAIRS TO KEEP TOGETHER ${}_8C_4$, THEN CHOOSE 1 OF THE OTHER 4 PAIRS TO LOSE BOTH ${}_4C_1$ THEN IN EACH OF THE 3 REMAINING PAIRS CHOOSE 1 OF PAIR TO LOSE GET $2^3$.

ANS: ${}_8C_4 = \dfrac{8 \cdot 7 \cdot 6 \cdot 5}{4 \cdot 3 \cdot 2 \cdot 1} = 7 \cdot 5 \cdot 2$, ${}_{16}C_5 = \dfrac{16 \cdot 15 \cdot 14 \cdot 13 \cdot 12}{5 \cdot 4 \cdot 3 \cdot 2 \cdot 1} = 14 \cdot 13 \cdot 12 \cdot 2$

GET $\dfrac{7 \cdot 5 \cdot 2 \cdot 4 \cdot 2^3}{14 \cdot 13 \cdot 12 \cdot 2} = \dfrac{20}{39}$ ANS. A.