

①

P(left thumb) =

$$\frac{4}{4} = 1 = \boxed{100\%}$$

Father

g

g

Mother

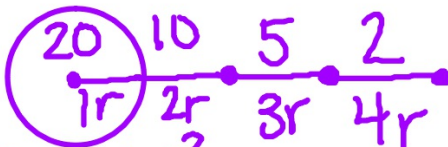
G

G

	G	G
g	Gg	Gg
g	Gg	Gg

2) Area of circle = πr^2
 $P(\text{area of } ZO) = \frac{\text{area of } ZO}{\text{total area}}$

$$P(\text{area of } ZO) = \left(\frac{\pi r^2}{4\pi r^2} \right) = \frac{1\cancel{\pi r^2}}{4\cancel{\pi r^2}}$$



$A = \pi(1r)^2$

$= \boxed{6.25\%}$

③

5pt, 10pt, 20pt
ring

10pt
20pt

$$\frac{\pi(3r^2) - \pi(2r)^2}{\pi(4r)^2} = \frac{9r^2\pi - 4r^2\pi}{16r^2\pi} = \frac{5\pi}{16\pi} = \frac{5}{16}$$

5pt
ring

$$P(\text{light-shaded Region}) = \frac{6}{16} = \boxed{37.5\%} \frac{5}{16} + \frac{1}{16}$$

5pt 20pt

$$P(5\text{pt or } 20\text{pt}) = 37.5\%$$

$$④ \quad P(< 20\text{pts}) = \frac{\text{Whole area} - \text{area of } 20\text{pt}}{\text{Whole area}}$$

$$P(< 20\text{pts}) = \frac{16\pi r^2 - \pi r^2}{16\pi r^2}$$

$$P(< 20\text{pts}) = \frac{15\cancel{\pi r^2}}{16\cancel{\pi r^2}} = \frac{15}{16} = 93.8\%$$

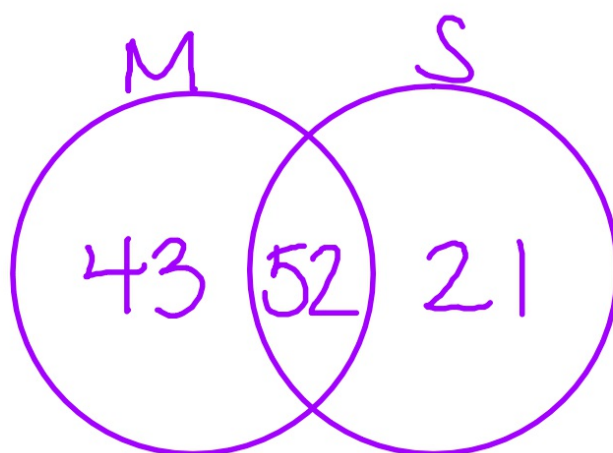
#5 and #6

Total
147

M - 95

S - 73

B - 52



5)

$P(\text{math or science or both})$

31

$$= \frac{116}{147} = 79\%$$

6) $P(\text{not math}) = \frac{52}{147} = 32.4\%$