Q1)

A) Wafer area for Wafer_X $= 3{,}14 \cdot 8^2 = 200{,}96\ cm^2$

Die area for Wafer_X $= \dfrac{200{,}96\ cm^2}{64} = 3{,}14\ cm^2$

Wafer area for Wafer_Y $= 3{,}14 \cdot 10^2 = 314\ cm^2$

Die area for Wafer_Y $= \dfrac{314\ cm^2}{100} = 3{,}14\ cm^2$

B) Yield for Wafer_X $= \dfrac{1}{(1+(0{,}02 \cdot 1{,}57))^2} = 0{,}94$

Cost per die for Wafer_X $= \dfrac{15}{64 \cdot 0{,}94} = 0{,}25$

Yield for Wafer_Y $= \dfrac{1}{(1+(0{,}03 \cdot 1{,}57))^2} = 0{,}91$

Cost per die for Wafer_Y $= \dfrac{24}{100 \cdot 0{,}91} = 0{,}26$

C)

Before year:

	diameter	Cost per wafer	Dies per wafer	Defects / cm^2
Wafer_X	16 cm	18,75	58,18	0,017
Wafer_Y	20 cm	30	90,91	0,026

Wafer area for Wafer_X $= 3{,}14 \cdot 8^2 = 200{,}96\ cm^2$

Die area for Wafer_X $= 200{,}96 / 58{,}18 = 3{,}45\ cm^2$

Yield for Wafer_X $= \dfrac{1}{(1+(0{,}017 \cdot 1{,}725))^2} = 0{,}94$

Cost per die for Wafer_X $= \dfrac{18{,}75}{58{,}18 \cdot 0{,}94} = 0{,}34$

Wafer area for Wafer_Y = $3{,}14 \cdot 10^2 = 314 \text{ cm}^2$

Die area for Wafer_Y = $314 / 90{,}91 = 3{,}45 \text{ cm}^2$

Yield for Wafer_Y = $\dfrac{1}{((1+(0{,}026 \cdot 1{,}725))^2} = 0{,}92$

Cost per die for Wafer_Y = $\dfrac{30}{90{,}91 \cdot 0{,}92} = 0{,}36$

Cost per die for Water_X is decreased by 26,47% according to the before year.

Cost per die for Wafer_Y is decreased by 27,78% according to the before year.

Q2)

A) P1: $3 \cdot 10^8 \cdot 2 + 5 \cdot 10^8 \cdot 4 + 2 \cdot 10^8 \cdot 3 = 3{,}2 \cdot 10^9$

P2: $3 \cdot 10^8 \cdot 3 + 5 \cdot 10^8 \cdot 3 + 2 \cdot 10^8 \cdot 3 = 3 \cdot 10^9$

B) P1: $3{,}2 \cdot 10^9 / 10^9 = 3{,}2$

P2: $3 \cdot 10^9 / 10^9 = 3$

C) P1: $\dfrac{3{,}2 \cdot 10^9}{3 \cdot 10^9} = 1{,}07\text{s}$

P2: $\dfrac{3 \cdot 10^9}{1{,}5 \cdot 10^9} = 2\text{s}$

D) P1 is 1,87 times faster than P2.

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