

-----1

1

$$\frac{b \cdot h^3}{12} | b = \sqrt{d^2 - h^2} \rightarrow i$$

$$\frac{\sqrt{d^2 - h^2} \cdot h^3}{12}$$

$$\text{solve}\left(\frac{d}{dh}(i)=0, h\right)$$

$$h = \frac{d \cdot \sqrt{3}}{2} \text{ or } h = \frac{-d \cdot \sqrt{3}}{2} \text{ or } h = 0$$

$$i | h = \frac{d \cdot \sqrt{3}}{2} \text{ and } d > 0$$

$$\frac{d^4 \cdot \sqrt{3}}{64}$$

-----2

-2

$$\frac{b \cdot h^2}{6} | b = \sqrt{d^2 - h^2} \rightarrow s$$

$$\frac{\sqrt{d^2 - h^2} \cdot h^2}{6}$$

$$\text{solve}\left(\frac{d}{dh}(s)=0, h\right)$$

$$h = \frac{d \cdot \sqrt{6}}{3} \text{ or } h = \frac{-d \cdot \sqrt{6}}{3} \text{ or } h = 0$$

$$s | h = \frac{d \cdot \sqrt{6}}{3} \text{ and } h > 0$$

$$\frac{d^3 \cdot \sqrt{3}}{27}$$

-----1

-1

$$\text{solve} \left(\frac{\left(\frac{a1}{2}\right)^2}{\left(\frac{15}{10} \cdot b0\right)^2} + \frac{\left(\frac{b1}{2}\right)^2}{b0^2} = 1, b1 \right)$$

$$b1 = \frac{2 \cdot \sqrt{9 \cdot b0^2 - a1^2}}{3} \text{ and } a1^2 - 9 \cdot b0^2 \leq 0 \text{ or } b1 = \frac{-2 \cdot \sqrt{9 \cdot b0^2 - a1^2}}{3} \text{ and } a1^2 - 9 \cdot b0^2 \leq 0$$

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$$\frac{b1 \cdot a1^3}{12} | b1 = \frac{2 \cdot \sqrt{9 \cdot b0^2 - a1^2}}{3} \rightarrow iy$$

$$\frac{a1^3 \cdot \sqrt{9 \cdot b0^2 - a1^2}}{18}$$

$$\text{solve} \left(\frac{d}{da1}(iy) = 0, a1 \right)$$

$$a1 = \frac{3 \cdot b0 \cdot \sqrt{3}}{2} \text{ or } a1 = \frac{-3 \cdot b0 \cdot \sqrt{3}}{2} \text{ or } a1 = 0$$

$$b1 = \frac{2 \cdot \sqrt{9 \cdot b0^2 - a1^2}}{3} | a1 = \frac{3 \cdot b0 \cdot \sqrt{3}}{2}$$

$$b1 = |b0|$$

$$iy|a1=\frac{3 \cdot b0 \cdot \sqrt{3}}{2} \text{ and } b1=b0$$

$$\frac{27 \cdot b0 \cdot |b0^3| \cdot \sqrt{3}}{32}$$

$$iy|a1=\frac{3 \cdot b0 \cdot \sqrt{3}}{2} \text{ and } b1=b0$$

$$1.46142 \cdot b0 \cdot |b0^3|$$

$$\text{-----}3$$

$$-3$$

$$\frac{b1 \cdot a1^2}{6} |b1=\frac{2 \cdot \sqrt{9 \cdot b0^2 - a1^2}}{3} \rightarrow sy$$

$$\frac{a1^2 \cdot \sqrt{9 \cdot b0^2 - a1^2}}{9}$$

$$\text{solve}\left(\frac{d}{da1}(sy)=0, a1\right)$$

$$a1=-b0 \cdot \sqrt{6} \text{ or } a1=b0 \cdot \sqrt{6} \text{ or } a1=0$$

$$b1=\frac{2 \cdot \sqrt{9 \cdot b0^2 - a1^2}}{3} |a1=b0 \cdot \sqrt{6}$$

$$b1=\frac{2 \cdot |b0| \cdot \sqrt{3}}{3}$$

$$\triangle sy|a1=b0 \cdot \sqrt{6} \text{ and } b1=\frac{2 \cdot |b0| \cdot \sqrt{3}}{3}$$

$$\frac{2 \cdot |b0^3| \cdot \sqrt{3}}{3}$$

$$\triangle sy|a1=b0 \cdot \sqrt{6} \text{ and } b1=\frac{2 \cdot |b0| \cdot \sqrt{3}}{3}$$

$$1.1547 \cdot |b0^3|$$

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$$\sqrt{d^2 - b^2} \rightarrow h$$

$$\sqrt{d^2 - b^2}$$

-----2

2

$$\triangle \frac{v \cdot q}{i \cdot b} | i = \frac{b \cdot h^3}{12} \text{ and } q = b \cdot \frac{h}{2} \cdot \frac{h}{4} \rightarrow \tau$$

$$\frac{3 \cdot v}{2 \cdot b \cdot \sqrt{d^2 - b^2}}$$

$$\triangle \text{ solve } \left(\frac{d}{db}(\tau) = 0, b \right)$$

$$b = \frac{d \cdot \sqrt{2}}{2} \text{ or } b = \frac{-d \cdot \sqrt{2}}{2} \text{ or } v = 0$$

$$h | b = \frac{d \cdot \sqrt{2}}{2}$$

$$\frac{|d| \cdot \sqrt{2}}{2}$$

$$\tau | b = \frac{d \cdot \sqrt{2}}{2}$$

$$\frac{3 \cdot v}{d \cdot |d|}$$

-----3

3

$$\triangle \sigma_y \cdot a_c \cdot y_c \cdot 2 | a_c = \frac{b \cdot h}{2} \text{ and } y_c = \frac{h}{4} \rightarrow mp$$

$$\frac{-b \cdot (b^2 - d^2) \cdot \sigma_y}{4}$$

$$\text{solve}\left(\frac{d}{db}(mp)=0,b\right)$$

$$b=\frac{d\cdot\sqrt{3}}{3}\text{ or }b=\frac{-d\cdot\sqrt{3}}{3}\text{ or }\sigma_y=0$$

$$h|b=\frac{d\cdot\sqrt{3}}{3}$$

$$\frac{|d|\cdot\sqrt{6}}{3}$$

$$mp|b=\frac{d\cdot\sqrt{3}}{3}$$

$$\frac{d^3\cdot\sigma_y\cdot\sqrt{3}}{18}$$

-----4

4

$$\text{solve}\left(\frac{d}{db}\left(\frac{b\cdot h^3}{12}\right)=0,b\right)$$

$$b=\frac{d}{2}\text{ or }b=\frac{-d}{2}\text{ or }b=-d\text{ or }b=d$$

$$h|b=\frac{d}{2}$$

$$\frac{|d|\cdot\sqrt{3}}{2}$$

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-----1.1	1.1
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$110 \cdot 24 + 24 \cdot 112 + 220 \cdot 24 \rightarrow a1$	10608
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$\frac{110 \cdot 24 \cdot (160 - 12) + 24 \cdot 112 \cdot (24 + 56) + 220 \cdot 24 \cdot 12}{110 \cdot 24 + 24 \cdot 112 + 220 \cdot 24} \rightarrow y1$	63.0769
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$160 - 63.076923076923 \rightarrow y2$	96.9231
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$\frac{110 \cdot 24^3}{12} + 110 \cdot 24 \cdot (y2 - 12)^2 + \frac{24 \cdot 112^3}{12} + 24 \cdot 112 \cdot \left(y2 - 24 - \frac{112}{2}\right)^2 + \frac{220 \cdot 24^3}{12} + 220 \cdot 24 \cdot (y1 - 12)^2 \rightarrow i1$	3.67741E7
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$\sqrt{\frac{i1}{a1}} \rightarrow r1$	58.8781
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-----1.2	1.2
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$\frac{r1^2}{y2}$	35.7669
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$\frac{r1^2}{y1}$	54.9588
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$\frac{r1^2}{y1 \cdot y2}$	0.567036
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-----2.1	2.1
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$66 \cdot 24 + 180 \cdot 20 + 70 \cdot 16 \rightarrow a2$	6304.
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$\frac{66 \cdot 24 \cdot (220 - 12) + 180 \cdot 20 \cdot (16 + 90) + 70 \cdot 16 \cdot 8}{66 \cdot 24 + 180 \cdot 20 + 70 \cdot 16} \rightarrow y3$	114.218
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$220 - y3 \rightarrow y4$	105.782
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$\frac{66 \cdot 24^3}{12} + 66 \cdot 24 \cdot (y4 - 12)^2 + \frac{20 \cdot 180^3}{12} + 20 \cdot 180 \cdot \left(y4 - 24 - \frac{180}{2}\right)^2 + \frac{70 \cdot 16^3}{12} + 70 \cdot 16 \cdot (y3 - 8)^2 \rightarrow i2$	3.66306E7
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$\sqrt{\frac{i2}{a2}} \rightarrow r2$	76.2279
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-----2.2	2.2
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$\frac{r2^2}{y4}$	54.9309
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$\frac{r2^2}{y3}$	50.8735
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$\frac{r2^2}{y3 \cdot y4}$	0.480929
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