

ANSWERS: RATIOS OF SIMILARITY

$$\textcircled{1} \quad k = \frac{30}{20} = \frac{3}{2} \text{ or } 1.5$$

$$k^3 = (1.5)^3 = 3.375$$

Consumers are better off buying the larger bar. It is 3.375 times the volume, but only 3 times the price.

$$\textcircled{2} \quad k = \frac{35}{30} = 1.167$$

$$k^3 = 1.59$$

$$\frac{6.99}{4.99} = 1.4$$

The large box is the better deal. It is 1.4 times the price, but 1.59 times the volume.

$$\textcircled{3} \quad k = \frac{20 \text{ cm}}{12 \text{ cm}} = 1.67$$

$$k^3 = 4.63$$

The small cans are the better value.

The large can is 4.63 times the volume of the small can. If Jessica were to buy 4.63 small cans it would cost her $(4.63)(0.80) = \$3.70$

This is cheaper than the large can at \$3.99.

4.



$$k^2 = \frac{9}{4} \quad \therefore k = \frac{3}{2}$$

$$50\text{cm} \left(\frac{3}{2} \right) = 75\text{cm}$$

5.

$$k^3 = 8$$

$$\therefore k = 2$$

$$\therefore k^2 = 4$$

$$(150\text{cm}^2)(4) = 600\text{cm}^2$$

6.



$$r = 6\text{cm}$$

$$h = 15\text{cm}$$



$$r = 4\text{cm}$$

$$V = ?$$

$$\frac{4\text{cm}}{6\text{cm}} = \frac{2}{3} = \frac{h}{15} \quad h = 10\text{cm}$$

$$V = \frac{1}{3} \pi r^2 h$$

$$= \frac{1}{3} \pi (4)^2 (10) = 167.55\text{cm}^3$$

7.

$$k = 3$$

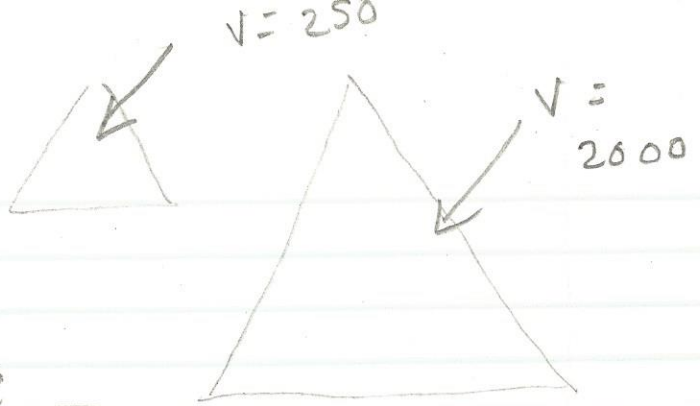
$$k^3 = 3^3 = 27$$

$$243\text{cm}^3 \div 27 = 9\text{cm}^3$$

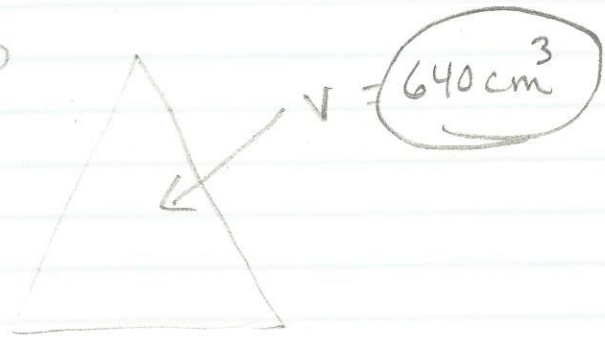
8. $k = 2$

$k^3 = 8$

$2000 \text{ cm}^3 - 250 \text{ cm}^3 = 1750 \text{ cm}^3$



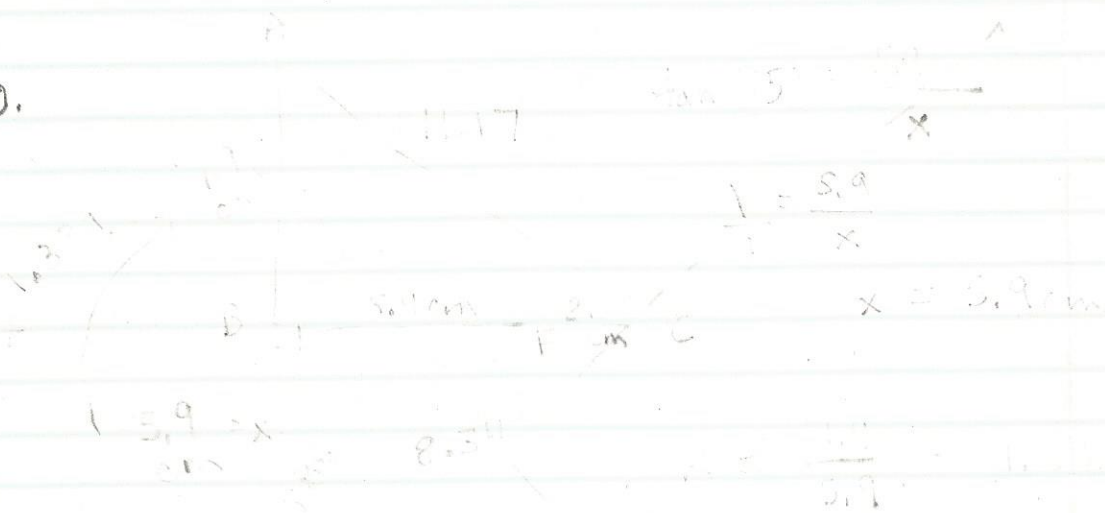
9. $V = 10$



$k = 4$

$k^3 = 4^3 = 64$

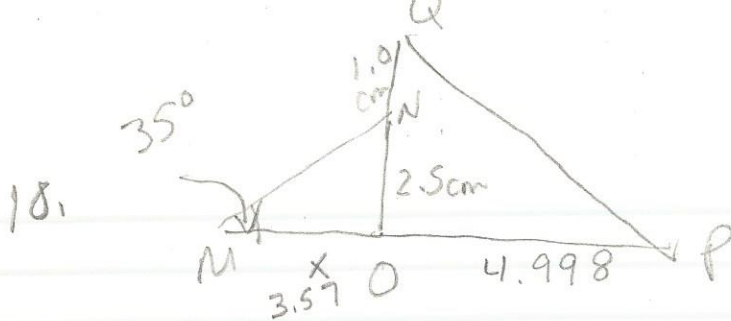
10.



$A = \frac{b \cdot h}{2} = \frac{(7.9)(7.9)}{2} = 31.2$

$A = \frac{b \cdot h}{2} = \frac{(5.9)(x)}{2} = 31.2$

$(10.17 \text{ cm})^2$



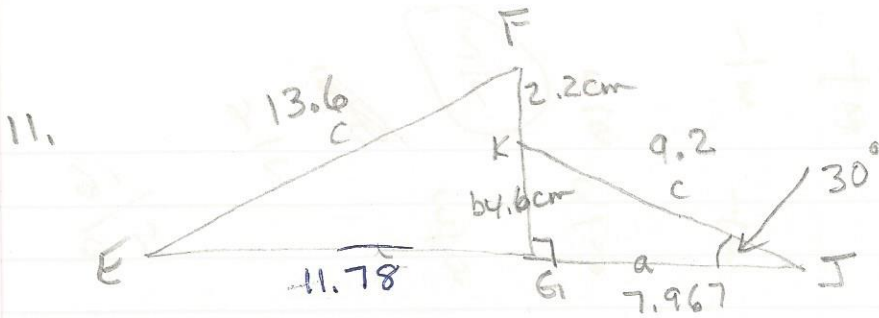
$$\tan 35 = \frac{2.5}{x}$$

$$0.7002 = \frac{2.5}{x} \quad x = 3.57$$

$$k = \frac{3.5}{2.5} = 1.4$$

$$\frac{(4.998)(3.5)}{2} + \frac{(3.57)(2.5)}{2} = 8.7465 + 4.4625$$

$$= 13.2 \text{ cm}^2$$



$$\tan 30^\circ = \frac{4.6 \text{ cm}}{a}$$

$$K = \frac{6.8}{4.6} = 1.4783$$

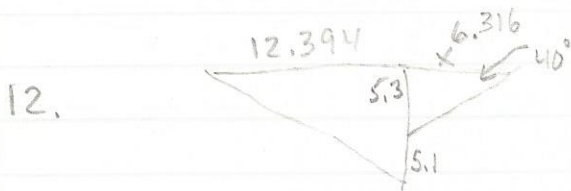
$$0.5774 = \frac{4.6}{a}$$

$$\overline{EG} = (7.967)(1.4783)$$

$$a = 7.967$$

$$A = \frac{(11.78 \text{ cm})(6.8 \text{ cm})}{2} \quad A = \frac{(7.967)(4.6)}{2}$$

$$= 40.052 \quad + \quad = 18.32 \quad = 58.4 \text{ cm}$$



$$K = \frac{10.4}{5.3} = 1.9623$$

$$\tan 40 = \frac{5.3}{x}$$

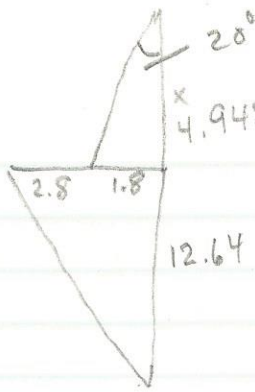
$$0.8391 = \frac{5.3}{x}$$

$$x = 6.316$$

$$A = \frac{(12.394)(10.4)}{2} \quad A = \frac{(6.316)(5.3)}{2}$$

$$64.45 + 16.74 = 81.2 \text{ cm}^2$$

13.



$$4.9455 \tan 20 = \frac{1.8}{x}$$

$$0.36397 = \frac{1.8}{x}$$

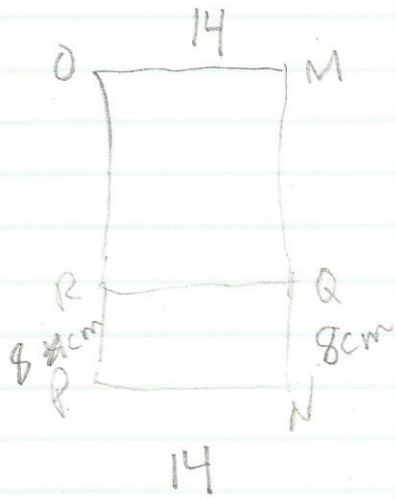
$$x = 4.9455$$

$$k = \frac{4.6}{1.8} = 2.56$$

$$\frac{(12.64)(4.6)}{2} + \frac{(4.9455)(1.8)}{2}$$

$$29.07 + 4.45 = 33.52 = 33.5 \text{ cm}^2$$

14.



$$\frac{4}{7} = \frac{8}{14}$$

$$\frac{4}{7} = \frac{14}{MN}$$

$$MN = 24.5$$

$$(24.5)(14)$$

$$343 \text{ cm}^2$$