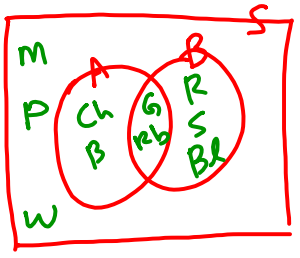
Practice Problems (on Canvas, from Chp 9 & 10)

#6) (a) $S = \{G, Ch, R, B, W, Rb, S, M, Bl, P\}$

(b) $A = \{G, Ch, B, Rb\}$

$B = \{G, Rb, R, S, Bl\}$



(c) $P(B) = \frac{n(B)}{n(S)} = \frac{5}{10} = \frac{1}{2}$

(d) $P(A \cup B) = \frac{7}{10}$ (e) $P(A|B) = \frac{2}{5}$

(f) $P(B|A) = \frac{2}{4} = \frac{1}{2}$

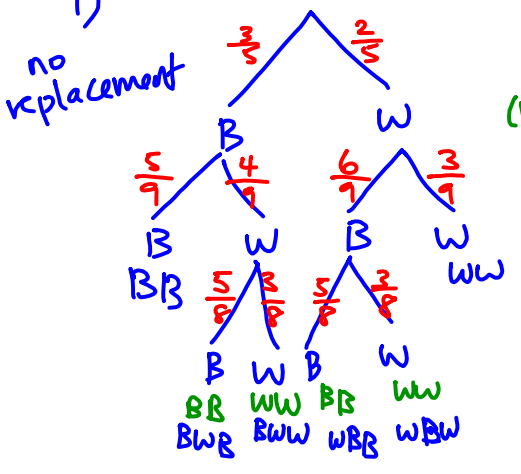
(g) odds in favor of choosing one we both like

$2:8 = 1:4$

(h) odds against at least one of us liking it

$3:7$

4) no replacement



6 B, 4 W to start

(b) P(2 draws needed)

$= P(BB \text{ or } WW)$

$= \frac{3}{5}\left(\frac{5}{9}\right) + \frac{2}{5}\left(\frac{3}{9}\right)$

$= \frac{1}{3} + \frac{2}{15} = \frac{7}{15}$

(c) P(get white pair)

$= P(BWW \text{ or } WBW \text{ or } WW)$

$= \frac{3}{5}\left(\frac{4}{9}\right)\left(\frac{3}{8}\right) + \frac{2}{5}\left(\frac{4}{9}\right)\left(\frac{3}{8}\right) + \frac{2}{5}\left(\frac{3}{9}\right)$

$= \frac{1}{10} + \frac{1}{10} + \frac{2}{15}$

$= \frac{1}{5} + \frac{2}{15} = \frac{5}{15} = \frac{1}{3}$

2)(c) 24 students (12 B, 12 G)

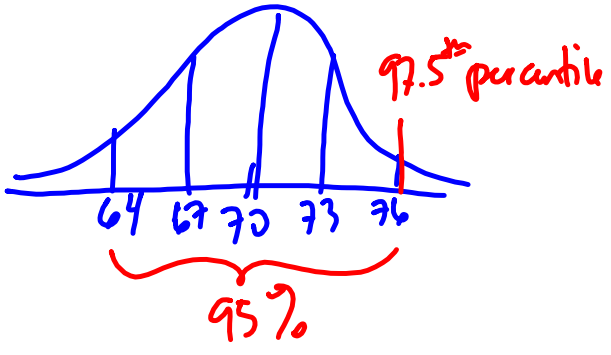
```
          1
        1   1
      1   2   1
    1   3   3   1
  1   4   6   4   1
1   5  10  10   5   1
1   6  15  20  15   6   1
```

$2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 = 2^6$

1)(c) avg (mean) 70 in $\sigma = 3$ in

6ft 4in = 76 in

$\Rightarrow$ 2.5% of men are taller

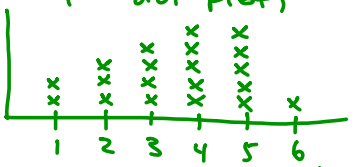


Bring to final exam:

1. $8\frac{1}{2} \times 11$ inch reference card/note
2. calculator
3. protractor
4. compass & straight edge

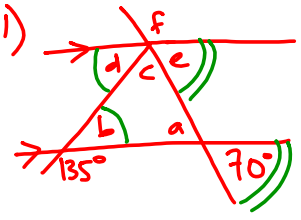
"Data on us" wksht

1c) Line plot (example) (or dot plot)



Sp 2013 Final Exam

1)



$a = 70°$ (vertical angle)

$b = 45°$ (supplementary to 135° angle)

$c = 180 - 70 - 45 = 65°$

$d = 45°$ (alt. int. angles)

$e = 70°$ (corresponding angles)

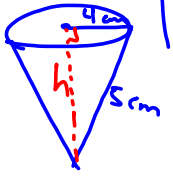
$f = 110°$ (supp. to e)

2) $SA = \pi \cdot 4^2 + \pi(4)(5)$ cm^2

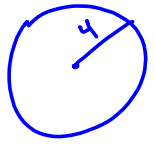
right circular cone:

$SA = \pi r^2 + \pi r l$

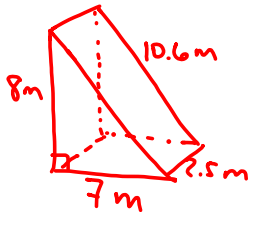
$r = 4$ cm, $l = 5$ cm



$4^2 \cdot \pi$ area of circle



3) (a)



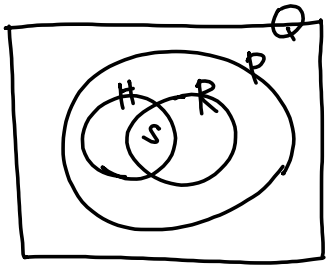
right, right triangular prism

$SA = 2A + Ph$

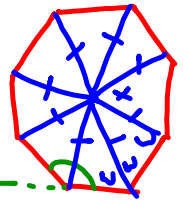
$= 2\left(\frac{1}{2}(8)(7)\right) + (8+7+10.6) \cdot (2.5)$

4) Q = quadrilaterals, P = parallelograms

R = rectangles, H = rhombuses, S = squares



5)



all angles sum to:

$x = \frac{360°}{8} = \frac{90}{2} = 45°$

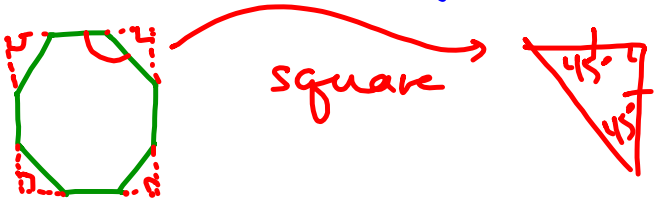
one interior $\triangle$

$180 - 45 = 2w$

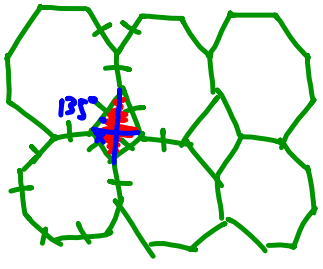
$135 = 2w$

$w = 67.5°$

interior angle/vertex angle $= 2w = 135°$

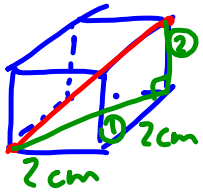


it won't tesselate because putting together reg. octagons around a point won't/can't produce exactly 360°

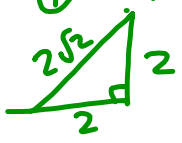


square

6)

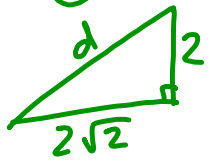


(1) (base)



$2^2+2^2=8$

(2)



$(2\sqrt{2})^2+2^2=d^2$

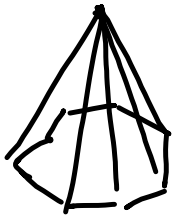
$8+4=d^2$

$d^2=12$

$d=\sqrt{12}=2\sqrt{3}$ cm

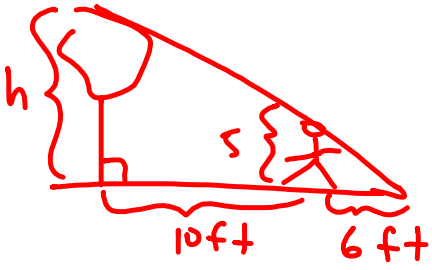
7) 7 (2 bases, 5 lateral)

8)

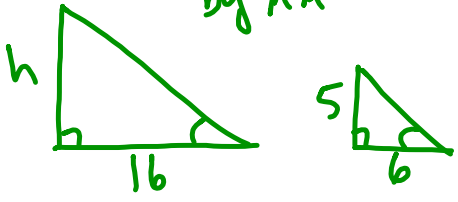


9 vertices

9)



similar by AA



$\frac{16}{6}=\frac{h}{5}$

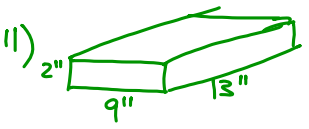
$h=\frac{16(5)}{6}=\frac{8(5)}{3}=\frac{40}{3}$ ft

10) how many seconds?

$$100\text{ ft}\left(\frac{1\text{ mi}}{5280\text{ ft}}\right)\left(\frac{1\text{ hr}}{200\text{ mi}}\right)\left(\frac{60\text{ min}}{1\text{ hr}}\right)\left(\frac{60\text{ sec}}{1\text{ min}}\right)$$

$$= \frac{100(60)(60)}{5280(200)}\text{ sec}$$

11)



$V = 2(9)(13) = 26(9)$

$= 234\text{ in}^3$

$V = 2(\pi r^2 h)$

$2\pi r^2 h = 234$

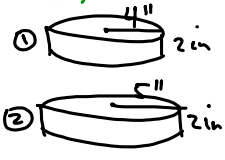
$2\pi(16)h = 234$

$h = \frac{234}{2(16)\pi}$ in

12) $1\frac{1}{2}$ cups flour for

? " "

for



$V_1 = \pi(4^2)(2) = 32\pi\text{ in}^3$

$V_2 = \pi(5^2)(2) = 50\pi\text{ in}^3$

$\frac{32\pi}{3/2} = \frac{50\pi}{x}$

$x\left(\frac{32\pi}{3/2}\right) = 50\pi$

$x = 50\pi\left(\frac{3/2}{32\pi}\right)$

$= \frac{25(3)}{32} = \frac{75}{32}$ cups

$= 2\frac{11}{32}$

13)

1
1 1
1 2 1
1 3 3 1
1 4 6 4 1
1 5 10 10 5 1
1 6 15 20 15 6 1
0H 1H 2H 3H 4H 5H 6H

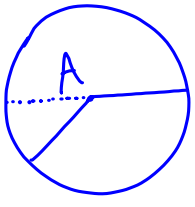
$P(4H) = \frac{15}{64}$

P(at least 4H) $= \frac{1+6+15}{64} = \frac{22}{64} = \frac{11}{32}$

14) $\underbrace{({}_3C_1 + {}_3C_0)}_{\text{cheese}}\ \underbrace{{}_8C_1}_{\text{bread}}\ \underbrace{2''}_{\text{veggies}}\ \underbrace{({}_6C_3 + {}_6C_2 + {}_6C_1 + {}_6C_0)}_{\text{sauce}}$

sandwiches $= ({}_3C_1 + {}_3C_0)({}_8C_1)(2'')({}_6C_3 + {}_6C_2 + {}_6C_1 + {}_6C_0)$

$= (3+1)(8)(2'')(20+15+6+1) = 32(2'')(42)$



A 65% $\rightarrow 0.65(360^\circ) = 234^\circ$

B 11% $\rightarrow 0.11(360^\circ) =$

C 4% $\rightarrow 0.04(360^\circ) =$

D 20% $\rightarrow (0.2)(360^\circ) =$

17)

Housing	16000
food	12000
clothes	6000
misc	8000
savings	6000
	$48000

$\frac{16000}{48000} = \frac{1}{3} = 33.\overline{3}\%$ $\quad \frac{1}{3}(360) = 120°$

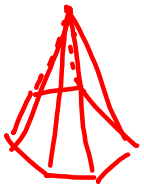
$\frac{12000}{48000} = \frac{1}{4}$ $\quad \frac{1}{4}(360) = 90°$

$\frac{6000}{48000} = \frac{1}{8}$ $\quad \frac{1}{8}(360) = 45°$

$\frac{8000}{48000} = \frac{1}{6}$ $\quad \frac{1}{6}(360) = 60°$

$\frac{6000}{48000} = \frac{1}{8}$ $\quad 45°$

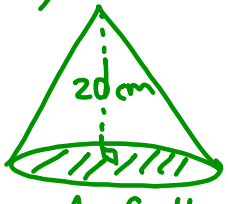
1) $360 - 120 - 50 - 80 = 110°$

2) 

7 faces
12 edges
7 vertices

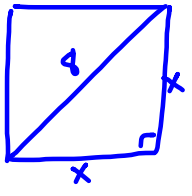
3) $3.2\,mg\left(\frac{1\,g}{1000\,mg}\right)$
$= 0.0032\,g$

4) $C = \pi d$
$58 = \pi d \rightarrow d = \frac{58}{\pi}\,cm$

5) 

A of ellipse base
$47\,cm^2$

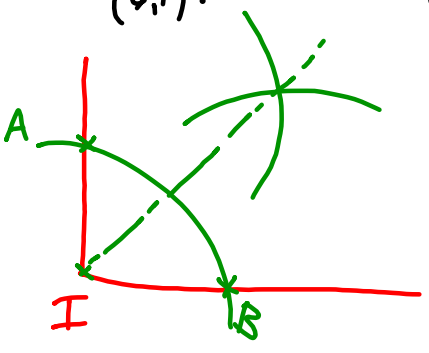
$V = \frac{1}{3}Ah = \frac{1}{3}(47)(20) = \frac{940}{3} = 313.\overline{3}\,cm^3$

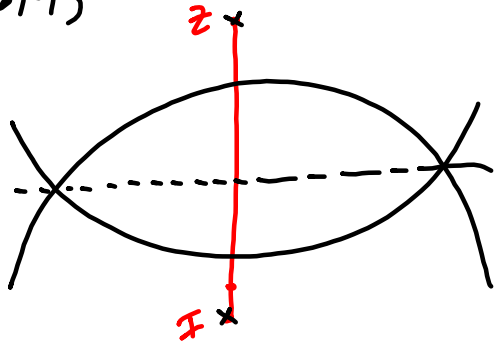
6) 

$x^2 + x^2 = 8^2$
$2x^2 = 64$
$x^2 = 32$
$x = 4\sqrt{2}$ units

7) $S = \{(1,1), (1,2), (1,3) \ldots (1,6)$
$(2,1) \ldots$
$\vdots$
$(6,1) \ldots (6,6)\}$

$P(\text{sum of } 5) = \frac{4}{36} = \frac{1}{9}$

8) 



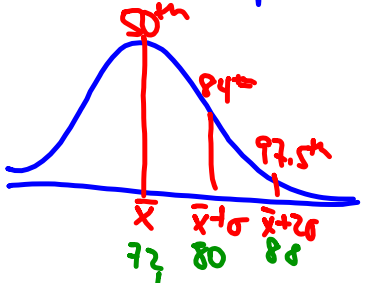
1) (a)

SD	#	mean	class
5	12	87	C1
8	18	72	C2

$\bar{x} = \dfrac{(12)87 + 18(72)}{30}$

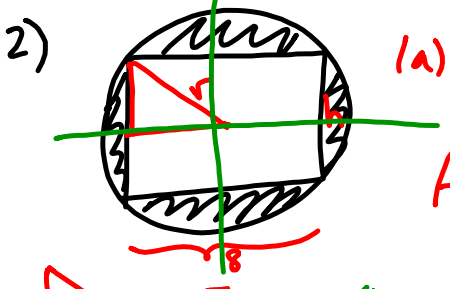
(b) skip

(c) what percent of students scored 88 or better in C2?



2.5%.

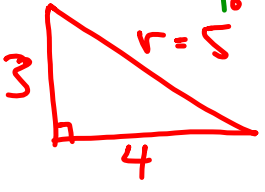
2)



(a) $A_{shaded} = ?$ $r = 5$ cm, $h = 6$ cm

$A_{\circ} - A_{\square} = \pi(5^2) - 6(8) = 25\pi - 48$

$\approx 30.54\ cm^2$



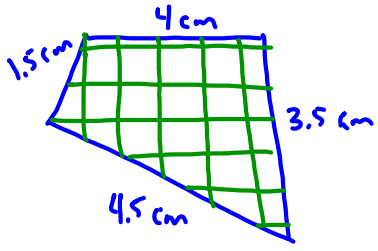
(b) 2 lines of symmetry

rotation sym. every 180°

3) $V_{old} = 16\ cm^3$ $SA_{old} = 36\ cm^2$ scaling factor $= \frac{3}{2}$

$V_{new} = \left(\frac{3}{2}\right)^3(16)$

$SA_{new} = \left(\frac{3}{2}\right)^2(36)$

4) 

$P = 1.5 + 4 + 3.5 + 4.5$ cm

5) (a) $P(3H \text{ or } 4H) = P(3H) + P(4H) = \frac{{}_8C_3}{256} + \frac{{}_8C_4}{256} = \frac{126}{256} = \frac{63}{128}$

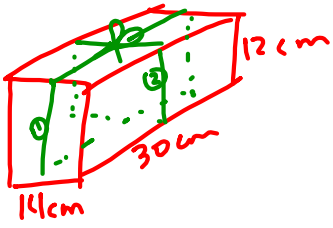
(b) $P(\text{at least } 3H \mid \text{more than } 2H) = P(\text{at least } 3H \mid 3H \text{ or } 4H \text{ or } 5H \text{ or } 6H \text{ or } 7H \text{ or } 8H)$

$= 1$

(c) odds in favor of 3H

$P(3H) = \frac{56}{256} = \frac{7}{32}$

7:25

6) 

(a) $SA = 2(14(12) + 14(30) + 12(30))\ cm^2$

(b) $\underset{①}{(12+30)}2 + 2\underset{②}{(14+12)} + \underset{\text{box}}{100}$ cm

(c) $V = 14(30)(12)\ cm^3 \left(\frac{1\ ml}{1\ cm^3}\right)\left(\frac{1\ l}{1000\ ml}\right)$

$= \frac{5040}{1000}\ l = 5.04\ l$

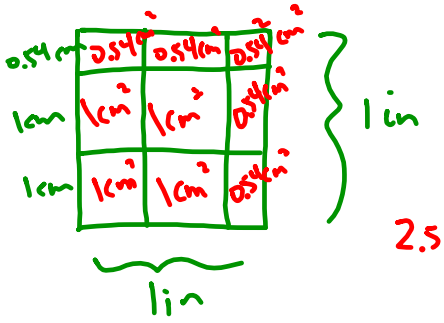
I can fill 2 2-liter bottles. (takes care of 4 l)

$\frac{1.04}{2} = 0.52 \approx 52\%$ of 2-liter bottle

$\Rightarrow$ fills 2.52 2-liter bottles

Part 3

1)



$2.54\text{cm} = 1\text{in}$

$1\text{in}^2 = (4 + 4(0.54) + 0.54^2)\text{cm}^2$

$= 6.4516\text{cm}^2$

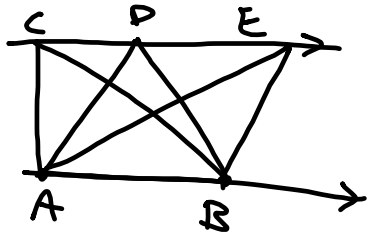
$2.54^2 = (2 + 0.54)^2$

$= (2+0.54)(2+0.54)$

$= 2(2) + 2(0.54) + 2(0.54) + 0.54^2$

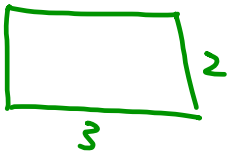
$= 4 + 4(0.54) + 0.54^2$

2)



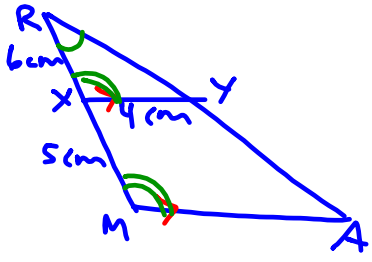
ΔABC, ΔABD, ΔABE all have same area

(3) perimeter # < area # always?



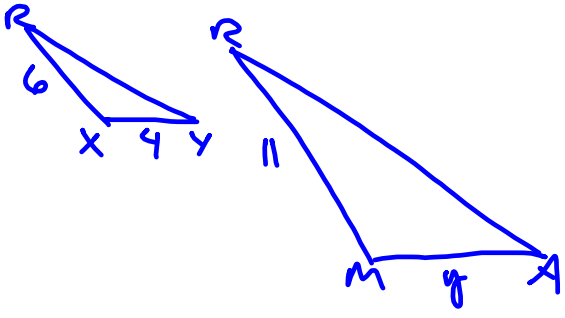
$P = 10$ units $A = 6$ units^2

4)



$\Delta RMA \sim \Delta RXY$ by AA

$AM = ?$

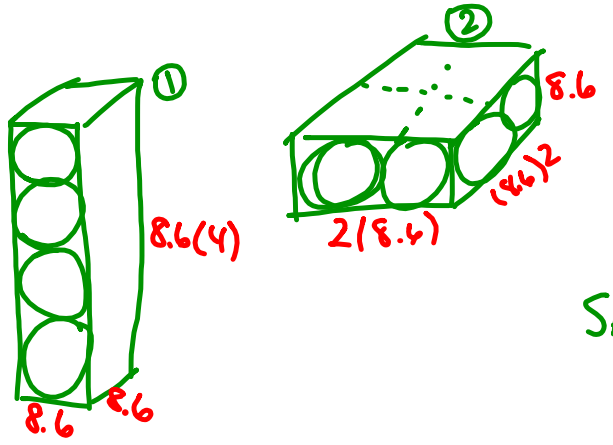


$\frac{6}{11} = \frac{4}{y} \iff 6y = 44$

$y = \frac{44}{6} = \frac{22}{3}\text{cm}$

not enough info to compute AR

Part 4 1)



$r_{base} = 4.3\,cm$

$SA_1 = 2(8.6(8.6)) + 4(8.6(8.6)(4))$

$= 8.6^2(2+16)$

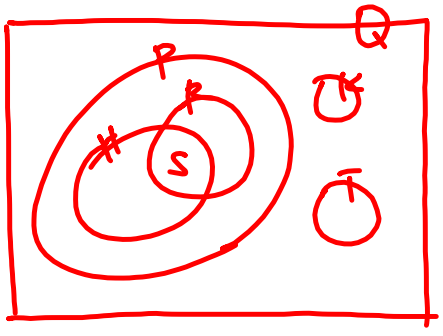
$= 8.6^2(18) = 1331.28\ cm^2$

$SA_2 = (2(8.6)(8.6))2 + 4(2(8.6)(8.6))$

$= 8.6^2(4+8) = 12(8.6)^2$

$= 887.52\ cm^2$

2)



Kites (K)
Trapezoids (T)
- Parallelograms (P)
- rectangles (R)
- squares (S)
- rhombuses (H)

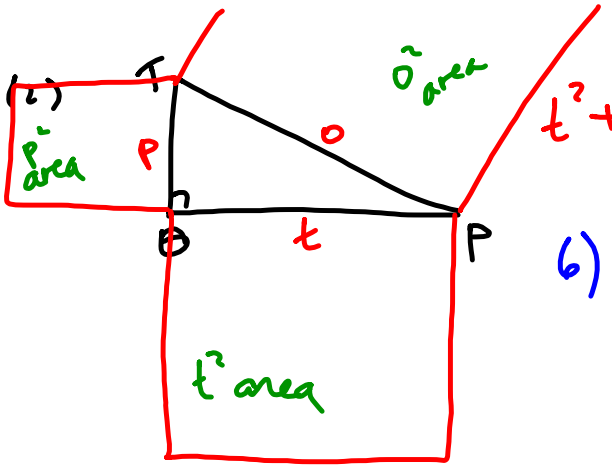
3) ${}_4C_2$ vs ${}_4P_2$

${}_4C_2 = \frac{4!}{2!\,2!} = \left(\frac{4!}{2!}\right)\left(\frac{1}{2!}\right)$

${}_4P_2 = \frac{4!}{2!}$ ${}_4C_2 = \frac{{}_4P_2}{2!}$

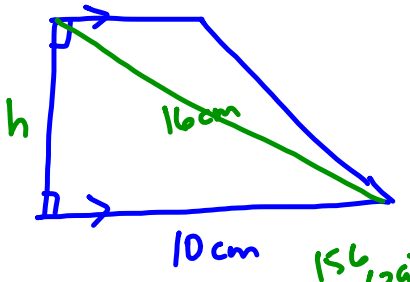
Part 5

1) t (2)



$t^2 + p^2 = o^2$

6)



$156 = 4(39)$

$h^2 + 10^2 = 16^2$

$h^2 = 256 - 100$

$h^2 = 156$

$h = \sqrt{156} = 2\sqrt{39}$ cm