

MATH 1435 – FINAL TEST REVIEW

1. Definitions: make sure you know the terms for radius, diameter, area, volume, rim speed etc.
2. How much will it cost to put hardwood flooring in a room that is 12ft x 16'-8" when the flooring cost \$4.50/sqft?
3. $\frac{1}{2} + \frac{15}{32} =$
4. $\frac{2}{3} \div \frac{3}{4} =$
5. $\frac{3}{4} \div \frac{1}{5} =$
6. Convert 625mm to m
7. Convert 55cm to m
8. Divide \$275.00 between two people at a ratio of 3:4
9. What is the optimum rim speed for most woodworking cutterheads?
10. What is the diameter of a pulley if it revolves at 345 rpm if it is driven by a 5" pulley running at 1,035 rpm?
11. If a motor (3600 rpm) with a 6" pulley drives an arbor at 7200 rpm. What is the diameter of the driven pulley?
12. What is the rim speed of a 3" cutterhead running at 9000 rpm?
13. What length of bandsaw blade is needed if the 2 wheel bandsaw has 18" dia. Wheels and a center to center measurement of 52"?
14. What length of sanding belt is needed if the edge sander has a 8" dia. Driving wheel and 3" dia. Idle wheel, the center to center measurement is 72"?
15. What is the length of a rafter if the width of a building is 28ft and the height of the roof is 14'?
16. How many sheets of 12mm thick sheets are in a lift that is 3.12m high?
17. If 1 inch = 25.4mm, what does 15.875mm equal?

MATH 1435 – FINAL TEST REVIEW

18. Calculate the total glue requirements for a veneered panel run for the following:

Quantity: 38 pcs of 5 ply panels finished size: 24" x 24"
 Glue ratio: 2:1 (resin: water) Coverage: 20 g /sqft
 Waste: 10%

Calculate:

- total sqft to cover
- Total grams of glue with waste
- Total grams of resin
- Total grams of water

19. Calculate the board footage for the following:

241 boards 42" x 6-1/2" x 4/4

20. Calculate the cost of the following:

25 – 3ply panels (consisting of)

1- Core 11/16" pb	20" x 18"	20% waste	\$0.45/sf
1- Face veneer	20" x 18"	100%waste	\$0.85/sf
1- Back veneer	20" x 18"	100%waste	\$0.35/sf
4- Headers	26" x 2-1/2"	60% waste	\$2.85/bf

21. 344 panels 18 3/4" x 20 1/2" x 5/4 = ? BF

22. Sarah and Kyle "thought once and cut twice" too many times. As a result, we need to reproduce:

A total of **47 pieces**, 3-ply tops (consisting of):

1 -	Particle core ($\frac{11}{16}$)	23" x 17"	add 20% waste	@ \$0.32/sqft
1 -	Face veneer	23" x 17"	add 100% waste	@ \$0.45/sqft
1 -	Back veneer	23" x 17"	add 100% waste	@ \$0.16/sqft
4 -	Headers	33" x 2 1/2" x 4/4	add 60% waste	@ \$2.92/bf

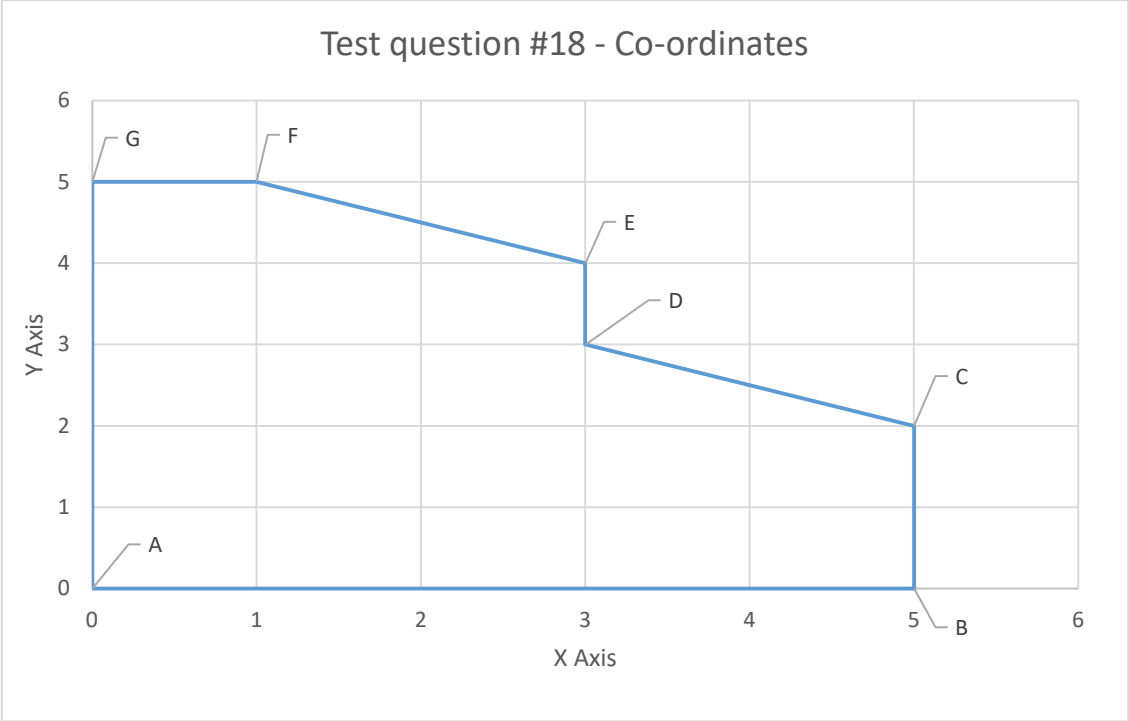
MATH 1435 – FINAL TEST REVIEW

What is the cost of their mistake?

- Fill in the cost of each part for the whole job. I.e. Particle core cost x 47 pcs for the “core cost”.
- **(Note:** - Calculate the sizes as is, do not change to rough sizes.)

MATH 1435 – FINAL TEST REVIEW

23. Based on the drawing shown, identify the points listed. Work counter clockwise. (1/2 mark per co-ordinate) (7 marks total)



Absolute Coordinates			Incremental Coordinates		
A	X0, Y0		A	X0, Y0	
B			B		
C			C		
D			D		
E			E		
F			F		
G			G		
A			A		

MATH 1435 – FINAL TEST REVIEW

Answer Key

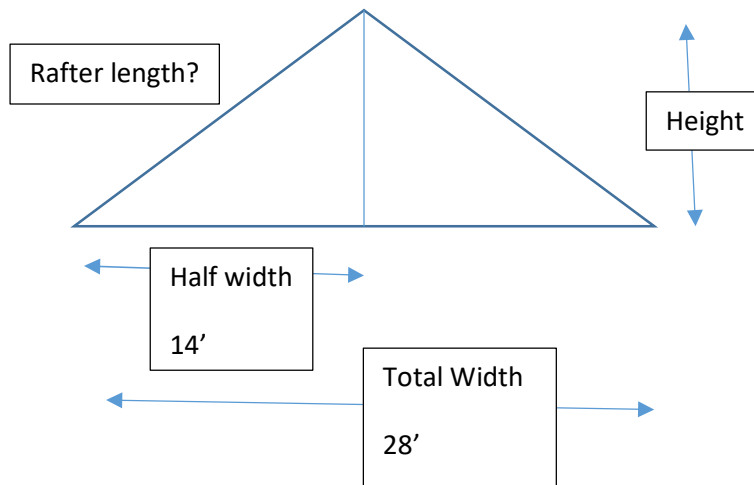
- 1) See Power points for Definitions.
- 2) $12' \times 16.67' (8''/12=.67) = 200.04 \times \$4.50 = \mathbf{\$900.18}$
- 3) $\frac{1}{2} + 15/32 = (\text{find the common denominator}) 16/32 + 15/32 = \mathbf{31/32}$
- 4) $2/3 \div \frac{3}{4} = (\text{reciprocal then multiply}) 2/3 \times 4/3 = \mathbf{8/9}$
- 5) $\frac{3}{4} \div 1/5 = (\text{reciprocal then multiply}) \frac{3}{4} \times 5/1 = 15/4 = (\text{reduce}) \mathbf{3-3/4}$
- 6) 625 mm to m (1000mm in 1 m) = $625 \div 1000 = \mathbf{.625 \text{ m}}$
- 7) 55 cm to m (100cm in 1 m) = $55 \div 100 = \mathbf{.55 \text{ m}}$
- 8) \$275 at a ratio 3:4. Add the total # of parts (3+4=7), divide the \$275 by the total # of parts to get 1 part = $\$275 \div 7 = \39.2857 per part. Now multiply 1 part against the ratio values. **3 parts x \$39.2857 per part = \$117.86,**
4 parts x \$39.2857 per part = \$157.14
- 9) **14,000 lfm**
- 10) Pulley ratio = drive/driven, $1035/345 = 3$. Since the arbor is slowing down, the driven pulley is (pulley ratio) 3 x's larger than the drive. **3x 5" = 15" pulley on the arbor.**
- 11) Pulley ratio = drive/driven, $3600 \div 7200 = 0.5$. Since the arbor is speeding up, the driven pulley is smaller than the drive by a factor of 0.5.
Therefore 0.5 (pulley factor) x 6" drive pulley = 3" driven pulley.
- 12) Rim speed = $\frac{\pi \times D}{12} \times \text{rpm}$
 $= \frac{\pi \times 3}{12} \times 9000$
= 7068.5834715 rpm
- 13) Bandsaw blade length = $(\pi \times d) + (2 \times \text{center to center})$
 $= (\pi \times 18) + (2 \times 52)$
 $= (56.55) + (104)$
= 160.5486678"
- 14) Sanding belt length = $(\frac{\pi \times d \text{ wheel } 1}{2}) + (\frac{\pi \times d \text{ wheel } 2}{2}) + (2 \times \text{cntr to cntr})$
 $= (\frac{\pi \times 8 \text{ wheel } 1}{2}) + (\frac{\pi \times 3 \text{ wheel } 2}{2}) + (2 \times 72)$
 $= (12.56637061) + (4.71238898) + (144)$
= 161.2787596"

MATH 1435 – FINAL TEST REVIEW



15)

Total width of building is 28' – divide in half to form 2 right angle triangles



$$C^2 = A^2 + B^2$$

$$C^2 = (14^2) + (14^2)$$

$$C^2 = (196) + (196)$$

$$C^2 = 392$$

C = square root of 392

$$C = 19.79898987'$$

16) 3.12m = convert to mm (x 1000) = 3120mm

$$3120\text{mm} \div 12\text{mm} = \mathbf{260 \text{ sheets}}$$

17) 1" = 25.4mm (15.875mm ÷ 25.4mm = 0.625") = 5/8"

MATH 1435 – FINAL TEST REVIEW

- 18) 38 pcs – 5 ply panels, finished size (24" x 24") rough size (25" x 25")
Glue ratio 2:1 (resin: water), coverage 20g/ sqft, waste 10%
- A) Find the sqft of 1 glue line
 $25'' \div 12 = 2.083333333'$ (change to decimal feet)
 $2.083333333' \times 2.083333333' = \mathbf{4.340277778 \text{ sqft for 1 glue line}}$
- B) Find the total sqft for all glue lines in 1 panel.
 $4.340277778 \text{ sqft} \times 4 \text{ glue lines per panel} = \mathbf{17.36111111 \text{ sqft}}$
- C) Find the total sqft of glue lines for all panels
 $17.36111111 \text{ sqft} \times 38 \text{ panels} = \mathbf{659.722222 \text{ sqft}}$
- D) Find the amount of glue required in grams
 $659.722222 \text{ sqft} \times 20 \text{g/sqft (coverage)} = \mathbf{13194.44444 \text{g}}$
- E) Add the waste
 $13194.44444 \text{g} + 10\% = \mathbf{14513.88889 \text{g}}$
- F) Divide by the total number of parts (2+1 = 3) to find the weight of 1 part.
 $14513.88889 \text{g} \div 3 = \mathbf{4837.962963 \text{g per part}}$
- G) Now multiply the single part weight times the number of parts per ingredient
Resin = 2 parts $\times 4837.962963 \text{g/part} = \mathbf{9675.925926 \text{g}}$
Water = 1 part $\times 4837.962963 \text{g/part} = \mathbf{4837.962963 \text{g}}$
- 19) Bdft of 1 board = $\frac{\text{Length in inches} \times \text{width in inches} \times \text{thickness in inches}}{144}$
 $\text{Bdft of 1 board} = \frac{42 \times 6.5 \times 1}{144}$
 $\text{Bdft of 1 board} = 1.895833333$
 Since there are 241 boards - $1.895833333 \times 241 = \mathbf{456.8958333 \text{ bdft}}$

MATH 1435 – FINAL TEST REVIEW

20) 25 – 3 ply panels

A) Core 20" x 18"

Convert to decimal foot - $1.6666667' \times 1.5' = 2.5$ sqft

Add waste – 2.5 sqft + 20% = 3 sqft

Add cost of material – 3 sqft x \$0.45/ sqft = **\$1.35**

B) Face veneer 20" x 18"

Convert to decimal foot - $1.6666667' \times 1.5' = 2.5$ sqft

Add waste – 2.5 sqft + 100% = 5 sqft

Add cost of material – 5 sqft x \$0.85/ sqft = **\$4.25**

C) Back veneer 20" x 18"

Convert to decimal foot - $1.6666667' \times 1.5' = 2.5$ sqft

Add waste – 2.5 sqft + 100% = 5 sqft

Add cost of material – 5 sqft x \$0.35/ sqft = **\$1.75**

D) Headers (4) 26" x 2-1/2"

$$\text{Bdft of 1 board} = \frac{26 \times 2.5 \times 1}{144}$$

Bdft of 1 board = 0.451388888 bdft

Add waste – 0.451388888 bdft + 60% = 0.722222222 bdft for 1 header.

4 headers per panel, therefore 4×0.722222222 bdft =

2.888888889 bdft total for all 4 headers.

Add the cost. 2.888888889 bdft x \$2.85/ bdft = **\$8.23**

Now add up the total cost for 1 panel

Core = \$1.35

Face veneer = \$4.25

Back veneer = \$1.75

4 headers = \$8.23

Total for 1 panel = \$15.58 each

X's number of panels x25

Total cost = \$389.50

21. 1,147.7864583333 bdft

MATH 1435 – FINAL TEST REVIEW

22. Panel cost

- a. Core = \$49.01
- b. Face veneer = \$114.86
- c. Back veneer = \$40.84
- d. Solid headers = \$503.21
- e. Total cost = \$707.91 (\$707.92 if using rounded cost)

23. Co-ordinates

Absolute Coordinates

A	0, 0
B	5, 0
C	5, 2
D	3, 3
E	3, 4
F	1, 5
G	0, 5
A	0, 0

Incremental Coordinates

A	X0, Y0
B	5, 0
C	0, 2
D	-2, 1
E	0, 1
F	-2, 1
G	-1, 0
A	0, -5