VANCOUVER ISLAND UNIVERSITY

Trades Math – Practice Assessment Test

- Please leave 2 or 3 digits after the decimal point – rounding is optional
- Calculators ARE allowed
- For full marks, you MUST include units in your answer e.g. 2 ft. or 2' NOT 2.

_____

Decimals and Simple Arithmetic

1. 3.5 + 8.09= _____
2. 3.5 – 0.34= _____
3. 3.5 x 8.09= _____
4. 3.5 ÷ 8.09= _____
5. If Max is paid $795.45 for a 35 hour work week. What is his hourly wage? _____

TIP: Use your calculator for these calculations, but, to avoid calculator error, have a rough idea of what the answer will be. For example, if the question is '*8.75 x 2.3'*, multiply the whole numbers 8 and 2 to get the approximate answer of 16

For more practice with decimals, whole numbers and simple arithmetic go to Study Guide 1 – Decimal Review

Adding and Subtracting Fractions:

6. $2\frac{2}{3} + 1\frac{5}{6} + \frac{1}{4} =$ _____
7. $\frac{12}{16} - \frac{2}{4} =$ _____
8. $\frac{9}{12} - \frac{1}{6} + 1\frac{3}{4} =$ _____

9. A piece of wood is cut into 3 pieces. The lengths are $3' 1\frac{3"}{8}$, $6' 3\frac{4"}{16}$ and $7' 4\frac{1"}{8}$. If $\frac{1"}{8}$ is used up for each saw cut (kerf), what is the length of the original board?

HINT: 2 kerfs are made in cutting the board. Reduce fraction to simplest terms.

_____

For more practice with decimals, whole numbers and simple arithmetic go to Study Guide 2 – Adding and Subtracting Fractions

Converting Fractions to Decimals and Decimals to Fractions

10. Write the following as a decimal : 25 hundredths _____
11. Write ⅓ as a decimal _____
12. Write 1.35 as a faction _____
13. Write 18% as a decimal _____

TIP: When converting fractions to decimals, remember that the line that separates the numerator from the denominator means *divide.* For example, if the question is *'write 5 tenths as a decimal',* write the fraction in a form you recognize e.g. 5/10, and then do the simple division 5 ÷ 10 = 0.5

When converting from decimals to fractions, think about the tenth, hundredth and thousandth columns. For example, if the question is *'write 6.67 as a fraction',* Look at the digits before the decimal point first. In this example, you have a 6 which is a whole number. Now look at the digits after the decimal point. You have a .6 and a .07 - the .6 denotes tenths, and the .07 denotes hundredths, so the answer is

6 67/100 (6 and 67 hundredths)

For more practice with fractions and decimals, go to Study Guide 3 – Converting Fractions to Decimals and Vice Versa

Exponents and Square Roots

14. Calculate 7^2 _____
15. Calculate 2^3 _____
16. What is the square root of 144? _____

TIP: Sometimes it is easy to get confused about the meaning of ^{2} or ^{3}. When we 'square' a number we are multiplying it by itself. When we 'cube' a number, we are multiplying it by itself and itself again; for example' 5^2 means 5x5 and means 5^3 5x5x5

For more practice with exponents and square roots, go to Study Guide 6 – Exponents and Roots

Percentages

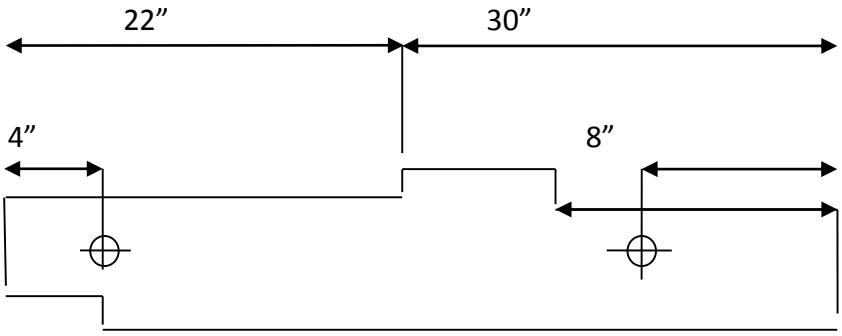
17. 5 is 20% of what amount? _____
18. What is 7% of 138? _____
19. John buys 3 t-shirts for $18.32 each, 1 pair of shorts for $29.99. How much is the total with 6% tax? _____

> TIP: Percentages can be tricky, but a couple of things might help:
> 1. % means 'out of 100', so 50% is the same as 50/100 or 0.5
> 2. The word 'of' in percentage calculations often means *multiply*
>
> ***For more practice with percentages, go to Study Guide 7 – Percentages***

Units of Measure

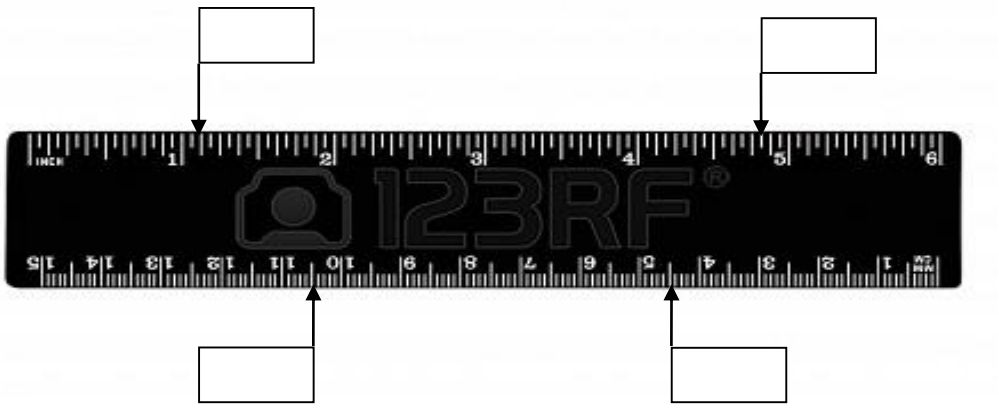
20. What is the distance between the centres of the 2 holes in the following diagram?

_____



21-24. Label this measuring tape with the correct lengths at the marks indicated.

Remember to include the correct units: inches or centimeters.



Conversions

25. Use the formula/conversion table at the end of this test to convert the following

A. 25 km =	_____miles	E. 5 kg=	_____pounds
B. 93 litres=	_____gallons	F. 15”=	_____’ _____”
C. 5 gallons=	_____litres	G. 3’=	_____”inches
D. 12 pounds (lbs)=	_____kg	H. 5”=	_____ cm

TIP: 1. When making conversions, you have a choice between dividing and multiplying. 2. Always check the units of measure being used. Sometimes we will test your accuracy and focus by mixing units of measure…

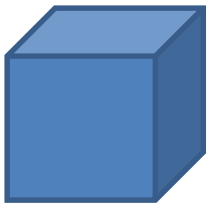
For more practice with conversions, go to Study Guide 4 – Units of Measurement and Study Guide 8 Using Imperial and Metric Rulers

Geometry *(use the formula table (if required)* ***to answer these questions***

26. Find the perimeter and area of the following shapes:

I.

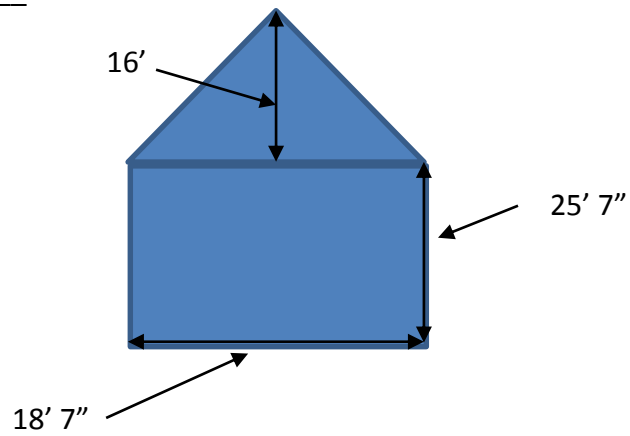
Length of one side = 8 m
Width of one side = 8 m



a) Perimeter (of one side of the cube) = _____

b) Area of entire cube = _____

II.

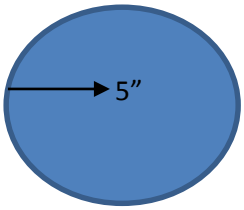


a) Perimeter of entire shape = _____

b) Area of entire shape = _____

TIP: When finding the area of ‘unusual’ shapes – try breaking the shape down into recognizable shapes, finding the area of each one and then adding them together for the area of the whole thing; for example, the ‘house’ shape above is really just a rectangle and 2 identical triangles.

III.

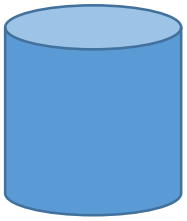


a) Area of the circle = _____

b) Radius of the circle =_____

c) Circumference of the circle = _____

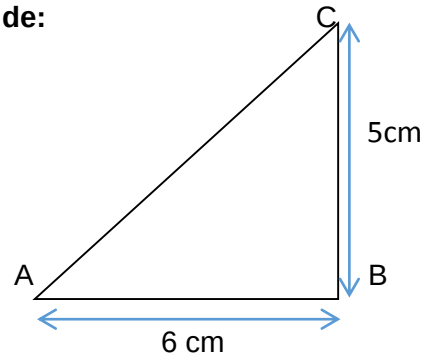
27. What is the volume of a can with a radius of 3 cm and a height of 15 cm?



_____

Using Pythagoras to Calculate the Length of an Unknown Side:

28. Calculate the length of side AC _____



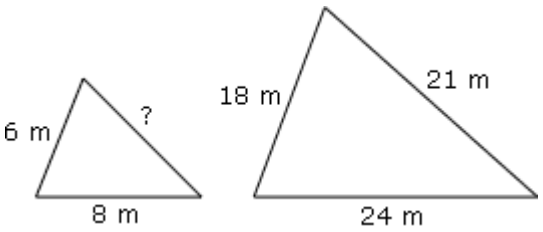
For more practice with geometry, go to Study Guide 5 – Area and Perimeter and Study Guide 9 - Using Pythagoras to Calculate the Length of an Unknown Side

Ratio and Proportion:

29. If Tom can drive 60 km on 3 gallons of fuel, how far can he drive on 19 gallons fuel?

_____

30. Find the length of the missing side in these similar triangles. _____



For more practice with ratio and proportion, go to Study Guide 12 – Ratio and Proportion

Algebra (Electrical, Power Engineering, RACM and HEO only)

31. Find the value of x

a) 3x = 25 -4 _____ b) $x/6$= 72 _____

For more practice with algebra, go to Study Guide 10 – Basic Algebra

Transposing and Conversions (Electrical and Power Engineering only)

32. Given that Efficiency % = $\frac{\text{Output Watts}}{\text{Input Watts}}$ x 100, solve for Input Watts:

Input Watts = _____

33. Given that A = $\frac{\pi}{4}$Dd, solve for D: D = _____

34. Convert 250 cm to m _____ m
35. Convert 25 cm² to m² _____ m²
36. Convert 900 cm³ to m³ _____ m³

For more practice with transposing and converting go to Study Guide 11 – Transposing Formulae

Formula table	Conversion Table
Area of Square/ Rectangle = l x w	1 litre = .26 gallons
Area of Triangle = $\frac{b \times h}{2}$	1 kilogram = 2.2 pounds
Volume of Cylinder = π r² h	1'' (Inch) = 25.4mm
Area of Circle = π r²	1 kilometre = .62mile
Circumference of Circle = π d	1'' (Inch) = 2.5cm
Pythagoras = a² + b² = c²	

You have completed the practice test. Review your answers below.

Answers: (please note that when Pi is required in any calculation, 3.14 (without additional digits) is used to get the answers below)

1. 11.59
2. 3.16
3. 28.31 (28.32)
4. 0.43
5. $22.73
6. $3\frac{21}{12}$ or $4\frac{9}{12}$ or $4\frac{3}{4}$
7. $\frac{2}{8}$ or $\frac{1}{4}$
8. $1\frac{16}{12}$ or $2\frac{4}{12}$ or $2\frac{1}{3}$
9. 201" or 16 ft. 9 in.
10. 0.25
11. 0.33 (0.32)
12. $1\frac{35}{100}$
13. 0.18
14. 49
15. 8
16. 12
17. 25
18. 9.66 (9.67)
19. $90.04 ($90.05)
20. 40 in.
21. $1\frac{1}{8}$ in.
22. $4\frac{13}{16}$ in.
23. 10.5 cm
24. 4.5 cm
25. a) 15.5 miles b) 24.18 gallons c) 19.23 litres d) 5.45 kg e) 11 pounds f) 1 ft 3" g) 36" h) 12.5 cm
26. i) a) 32 *m* b) 384 m^2 ii) a) 106.75 ft. b) 624.09 sq. ft. iii) a) 78.5 sq.in b) 5 " c) 31.4 "
27. 423.9 cm^3
28. 7.81 cm
29. 380 km
30. 7 m
31. a) x=7 b) x=432
32. Input Watts = $\frac{100 \times \text{Output Watts}}{\text{Efficiency \%}}$
33. $D = \frac{4A}{\pi d}$
34. 2.5m
35. 0.0025m²
36. 0.0009m³

If you find errors in this practice test, please email assessments@viu.ca