North Bennet Street School

CARPENTRY MATH – PRACTICE TEST 1

Version 1 – 8/2024

Practice Test 1

Section 1 - Number Basics: Addition, Subtraction, Multiplication, Division

Do not use a calculator for this section

Use the number 5,473,619 to answer the following questions:

1. Which digit is in the hundreds place? _____
2. Which digit is in the ten thousands place?_____
3. Which digit is in the tens place? _____
4. Which digit is in the hundred thousands place? _____
5. Which digit is in the thousands place? _____

Rounding (to the nearest)

1. Round 74,613 to the thousands place value_____
2. Round 642 to the hundreds place value _____

Rounding (UP)

3. Round Up 28,314 to the thousands place value _____
4. Round Up 3,468 to the hundreds place value _____

Addition

Add the following quantities

1.
3 feet
11 feet
+ 21 feet

2.
$220
+ 94

3. 20” + 32” + 42” + 16” =
4. A carpenter lays 1,200 wood shingles the first day, 1,500 the second day and 1,100 the third day. How many shingles does he use over the 3 days?

Subtraction

Subtract the following quantities

1.
48 feet
- 12 feet

2.
$300
- $84

3. You purchased 510 12’ studs for a shed project you are working on. You only used 453. How many do you have left after the project?

Multiplication (note: x and * both indicate multiplication)

1. 12 x 8 = ; 3 x 12 =. ; 4*8 = ;

2. 5 x 7

3. 31 x6

4. A business sells sheds for a profit of $300 per shed. If they sell 12 sheds, what is their profit?

5. A deck is 20' x 10'. What is the total area of the deck? (Note: Area = length x width)

6. A roofing crew installs 4 squares of shingles per hour. At this rate, how many squares will they install in two 8 hour days?

Division

1. 24 ÷ 4 =
2. 48/12 =
3. $\frac{108}{9}$ =
4. 32 ÷ 6 = (answer in whole number with remainder. Ex. 11 ÷ 5 = 2 remainder 1)

YOU MAY USE YOUR CALCULATOR FOR THE REST OF THE TEST

READING A TAPE MEASURE (INCHES) – FORMAT: 2 ¼”

1) 

_____

2) 

_____

3) 

_____

4) 

_____

5) 

_____

6) 

_____

7) 

_____

8) 

_____

READING A TAPE MEASURE (FEET & INCHES)

1. Answer: Example __1__feet __7 5/16__inches or __1'–7 5/16"__	
2. Answer: ____feet _____inches or _____	
3. Answer: ____feet ___inches or _____	
4. Answer: ____feet _____inches or _____	
5. Answer: ____feet _____inches or _____	
6. Answer: ____feet ___inches or _____	

FRACTIONS: REDUCING, ADDITION & SUBTRACTION

Fully reduce all answers and show as proper/mixed numbers.

1) Reduce the following fractions: a. 4/8” = b. 12/16” = 2) Express the following improper fractions as mixed numbers *(remember to reduce the remaining fraction, if needed). Ex. 3 ½”* a. 7/4” = b. 11/2” =	Solve (remember to reduce the remaining fraction, if needed): 3) 1/4" + 1/4” = 4) 1/2” + 1/4" +1/8” = 5) 3 1/4” + 4 1/8” = 6) 7/8” - 5/8” = 7) 1 3/4” – 1/4" = 8) 13/16” – 2/8” – 1/4"=

FRACTIONS: MULTIPLICATION & DIVISION

Fully reduce all answers and show as proper fractions/mixed numbers. Watch units.

1) $\frac{3}{8} \times \frac{1}{2}$ = 2) 1/4" x 1/4 =	3) 4’ ÷ 8 = 4) 3/4" ÷ ½ =

5. What is half of 1/4”?
6. What is a quarter of 1/2”?
7. How may 6 ½” blocks can be cut from a 45 ½” board? (ignore kerfs)

CONVERT FRACTIONS TO DECIMALS - ALL INCHES

1) 1/2" = _____0.5”_____
2) 1/4" = _____
3) 3/4" = _____
4) 1/8” = _____
5) 9/16” = _____
6) 2 2/4” = _____

CONVERT DECIMALS TO FRACTIONS – ALL INCHES (remember to round and reduce your answer to a value on your tape measure: 16ths, 8ths, 4ths, half). We are just working in inches now. No feet (yet).

1) EX. 0.75" = ___12/16" = ¾"_____
2) 0.5" = _____
3) 0.625" = _____
4) EX. 21.1875" = __21 3/16"_____
5) 7.6875" = _____
6) 3.375" = _____
7) 13.875" = _____
8) 10.638" = _____

MORE MEASUREMENT CONVERSIONS

1. Convert feet to inches (remember multiply feet by 12 and add inches). Ex: 23"

a. 6' – 2" _____	c. 4' – 3" _____
b. 2 feet 3 inches _____	d. Half a foot _____

2. Convert inches to feet & inches. Ex. 3'-5"

a. 15 inches _____	c. 27 3/4 inches _____
b. 32" _____	d. 38 $\frac{5}{8}$ inches _____

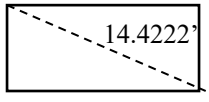
3. Convert decimal inches to fractional inches – Use 16ths of an inch and reduce. Ex. 11 1/16"

a. 25.8901" _____	c. 16.2500" _____
b. 4.3590" _____	d. 0.9359" _____

4. Convert decimal feet to feet and fractional inches - Use 16ths of an inch and reduce. Ex. 12'-8 3/8"

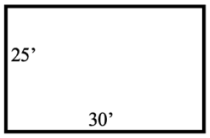
a. 11.786241' _____	c. 33.85298' _____
b. 12.2536 feet _____	d. 102.22222' _____

5. You are checking if an 8' x 12' wall is square by calculating the diagonal. Your answer is: 14.4222'. Convert 14.4222' to a fraction so you can read it on your tape measure (use 16ths).

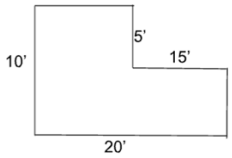


PERIMETER, AREA AND VOLUME

1) You need to build a <u>frame</u> for a concrete foundation that is 25' x 30'. You plan to use 2'x6' boards. How many <u>feet</u> of 2'x 6' boards do you need? (in other words – what is the perimeter of the below foundation)



2) What is the perimeter of the following shape? What is the area? (note: find missing sides for perimeter and break the shape down into rectangles for area)



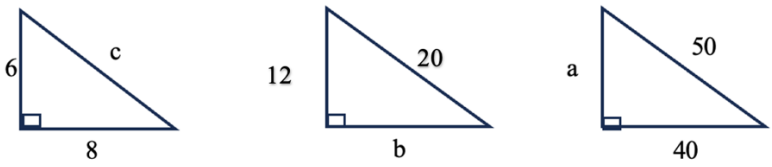
3) What is the area of a room that is 10' x 12'?

4) What is the area of a triangle with a base of 6' and a height of 2'3"?

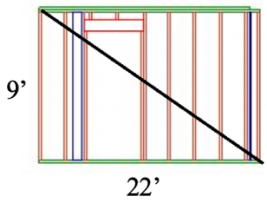
5) What is the perimeter and area of a 3' x 12' rectangular sand box? If you want to fill it with 1 ½" feet of sand, how much sand will you need? If sand is purchased, in 3 cubic feet bags ($3ft^3$), how many full bags will you need?

PRACTICING ANGLES

1) Use the Pythagorean theorem to find the missing sides of the following (3-4-5) right triangles:



2) You are trying to confirm if the below wall is square. What should your diagonal measure? Put your answer so you can read it on your tape measure (feet & fractional inches).



END OF PRACTICE TEST 1

ANSWER KEY – Practice Test 1

Ch. 1 - Number Basics: Addition, Subtraction, Multiplication, Division

Place Values 1. 6 ; 2. 7; 3. 1; 4. 4; 5. 3;
Rounding 1. 75000; 2. 600; 3. 29,000; 4. 3,500;

Addition 1. 35 feet; 2. $314; 3. 110 inches; 4. 4,800 shingles;
Subtraction 1. 36 feet; 2. $216; 3. 57 studs;
Multiplication 1. 96, 36, 32; 2. 35; 3. 186; 4. $3,600; 5. 200'; 6. 64 squares
Division 1. 6; 2. 4; 3. 12; 4. 5 remainder 2;

Ch. 2 - Measuring

Reading a Tape Measure in Inches. 1. 3 3/4"; 2. 4 1/16"; 3. 8 3/8"; 4. 1 13/16"; 5. 4 7/8"; 6. 2 ½"; 7. 7 ¼"; 8. 9 5/8";

Reading a Tape Measure in Feet & Inches 1. 1'- 7 5/16"; 2. 8'- 5 1/2"; 3. 9'- 4 1/4"; 4. 2'- 4 3/8"; 5. 5'- 4 1/8"; 6. 3'- 6 13/16"

Ch. 3 - Fractions

Fractions: Reducing, Addition & Subtractions. 1. a. ½", b. ¾"; 2. a. 1 ¾", b. 5 ½"; 3. ½" (reduced); 4. 7/8"; 5. 7 3/8"; 6. ¼"; 7. 1 ½"; 8. 5/16";
Fractions: Multiplication & Division. 1. 3/16"; 2. 1/16"; 3. 6"; 4. 1 ½"; 5. 1/8"; 6. 1/8"; 7. 7 blocks;

Ch. 4 - Decimals & Conversions

Convert Fractions to Decimals – All Inches

1) 1/2" = _____0.5"_____
2) 1/4" = _____0.25"_____
3) 3/4" = _____0.75"_____
4) 1/8" = _____0.125"_____
5) 9/16" = _____0.5625"____
6) 2 2/4" = ____2.5"_____

Convert Decimals to Fractions – All inches

1) 0.75" = ____12/16" = 3/4"_____
2) 0.5" = _____1/2"_____
3) 0.625" = ____10/16"=5/8"_____
4) 21.1875" = __21 3/16"_____
5) 7.6875" = _____7 11/16"____
6) 3.375" = _____3 3/8"_____
7) 13.875" = _____13 7/8"_____
8) 10.638" = _____10 5/8"_____

Ch. 5 - More Measurement Conversions

PRACTICE MEASUREMENT CONVERSIONS

1. Convert feet to inches:

a. 6' – 2"	_____74"_____	c. 4' – 3"	__51"_____
b. 2 feet 3 inches	_____27"_____	d. Half a foot	___6"_____

2. Convert inches to feet & inches

a. 14 inches	_____1' - 2"____	c. 27 ¾"	_____2' – 3 3/4"__
b. 32 inches.	_____2' - 8"____	d. 38 $\frac{5}{8}$ inches	_____3' – 2 5/8"__

3. Convert decimal inches to fractional inches – Use 16ths of an inch and reduce

a. 25.8901"	____25 7/8"____	c. 16.2500"	____16 1/4"_____
b. 4.3590"	_____4 3/8"____	d. 0.9359"	_____15/16"____

4. Convert decimal feet to feet and fractional inches

a. 11.786241'	____11' - 9 7/16"_	c. 33.85298'	____33' - 10 1/4"_
b. 12.2536 feet	____12' - 3 1/16"_	d. 102.22222'	___102' - 2 11/16"_

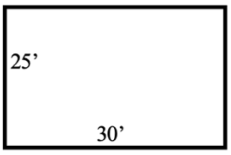
Solution to 4 a.:
11ft + .786241 partial ft;
Multiply .786241 by 12" to get inches: 9.434892";
9 inches + .434892 partial inches;
Multiply .434892 by 16 (16ths of an inch) = 6.9583 which rounds to 7/16
Answer: **11' – 9 7/16"**

5. You need to check if your 8' x 12' wall is square by calculating the diagonal. Your answer is: 14.4222'. Convert 14.4222' to feet and fractional inches so you can read it on your tape measure.

   14 feet plus .4222 partial feet.
   Convert to inches by multiplying by 12: 12 x .4222 = 5.0664 inches
   Convert to partial inches by multiplying by 16: 16 x .0664 = 1.0624; Rounds to 1.
   Answer: **If the wall is square, the diagonal must be 14' – 5 1/16".**

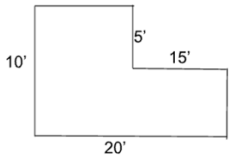
Ch. 8 - Perimeter, Area & Volume

1) You need to build a frame for a concrete foundation that is 25' x 30'. You plan to use 2'x6' boards. How many feet of 2'x 6' boards do you need? (in other words – what is the perimeter of the below foundation)



25' + 25' + 30' + 30' = **110'**

2) What is the perimeter of the following shape? What is the area? (note: find missing sides for perimeter and break the shape down into rectangles for area)



Missing sides are 5' (20'-15') and 5' (10'-5')

Perimeter: 10'+5'+5'+15'+5'+20' = **60"**
Area: Break shape into 2 rectangles: 5" x 5" + 5" x 20" = 25ft^2 + 100ft^2 = **125ft^2**

3) What is the area of a room that is 10' x 12'? **120ft^3**

4) What is the area of a triangle with a base of 6' and a height of 2'3"? **6.75ft^2 or 6'- 9"**

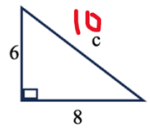
5) What is the perimeter and area of a 3' x 12' rectangular sand box? If you want to fill it with 1 ½" feet of sand, how much sand will you need? If sand is purchased, in 3 cubic feet bags (3ft^3), how many full bags will you need?

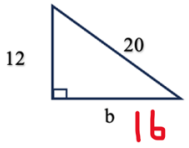
Perimeter: 3+3+12+12 = 30ft
Area: 3 x 12 = 36ft^2
Volume, amount of sand: 36ft^2 x 1.5ft = 54ft^3
54ft^3/3ft^3 = 18 bags

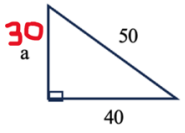
Answer Key

3) **Ch. 9 - Triangles**

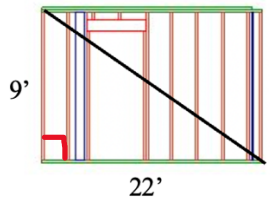
Use the Pythagorean theorem to find the missing sides of the following (3-4-5) right triangles:







4) You are trying to confirm if the below wall is square. What should your diagonal measure? Put your answer so you can read it on your tape measure (feet & fractional inches).



Use the Pythagorean Theorem to get the length of the diagonal	9^2+22^2= diagonal^2=565 Diagonal = $\sqrt[2]{565}$ = 23.7697 feet
Convert the answer from a decimal to feet and inches	
23.7697 feet:	23 full feet plus .7697 partial feet
Multiply partial feet by 12" to get inches	.7697 x 12 = 9.2367 inches
	9 full inches plus .2367 partial inches
Multiply partial inches by 16 to get how many 16ths of an inch	.2367 x 16 = 3.7829 – round to 4. So 4 16ths of an inch… 4/16"
Reduce 4/16"	4/16 is reduced to ¼"
Final Answer:	23 feet 9 ¼ inches; 23' – 9 ¼"

The wall is square if the diagonal measures 23' – 9 ¼".