

Shop Math Refresher: Part I *Self Study*

- If you get stuck on a problem, check the **Explanations** that follow the question section.
- When you are done with all the problems, check your answers against the Answer Key.

A 
132 inches


B 
168 inches

C 
56 inches

1. What is the total length of the three pipes?
 - a. 256 inches
 - b. 306 inches
 - c. 356 inches
 - d. 416 inches
 - e. *none of these*

A 
132 inches


B 
168 inches

C 
56 inches

2. How long is A?
- a. 11 feet
 - b. 12 feet
 - c. 14 feet
 - d. 16 feet
 - e. *none of these*

A 
132 inches


B 
168 inches

C 
56 inches

3. B is how many times as long as C?
- a. 2.0
 - b. 2.5
 - c. 3.0
 - d. 3.5
 - e. *none of these*

A 
132 inches

B 
168 inches

C 
56 inches

4. What is the length of a pipe that is 75% as long as C?
- a. 75 inches
 - b. 64 inches
 - c. 53 inches
 - d. 42 inches
 - e. *none of these*

TABLE OF SIEVE OPENINGS

Sieve No.	Sieve opening (milli-meters)	Sieve opening (inches)	Wire diameter (milli-meters)	Wire diameter (inches)
4	4.76	0.187	1.27	0.050
5	4.00	0.157	1.12	0.044
6	3.36	0.132	1.02	0.040
7	2.83	0.111	0.92	0.036
8	2.38	0.094	0.84	0.033
10	2.00	0.079	0.76	0.030
12	1.68	0.066	0.69	0.027
14	1.41	0.056	0.61	0.024

5. How many millimeters larger is the diameter of wire used in No. 7 sieves than that used in No. 12 sieves.
- 0.009
 - 0.230
 - 1.150
 - 1.230
 - none of these*

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14	1.41	0.056	0.61	0.024

6. What is the sieve opening, in inches, of a sieve in which the wire diameter is 0.033
- 2.38
 - 0.094
 - 0.84
 - 0.033
 - none of these*

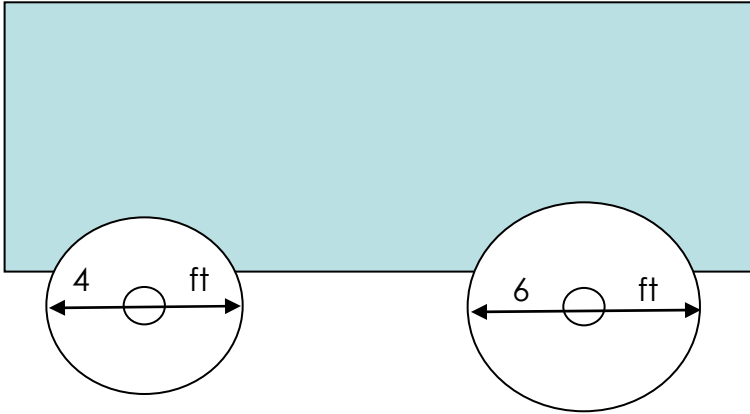
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7. What is the sieve opening, in millimeters, of a sieve that has $1/4$ the opening of a No. 6 sieve?
- a. 2.38
 - b. 2.00
 - c. 1.68
 - d. 1.41
 - e. *none of these*

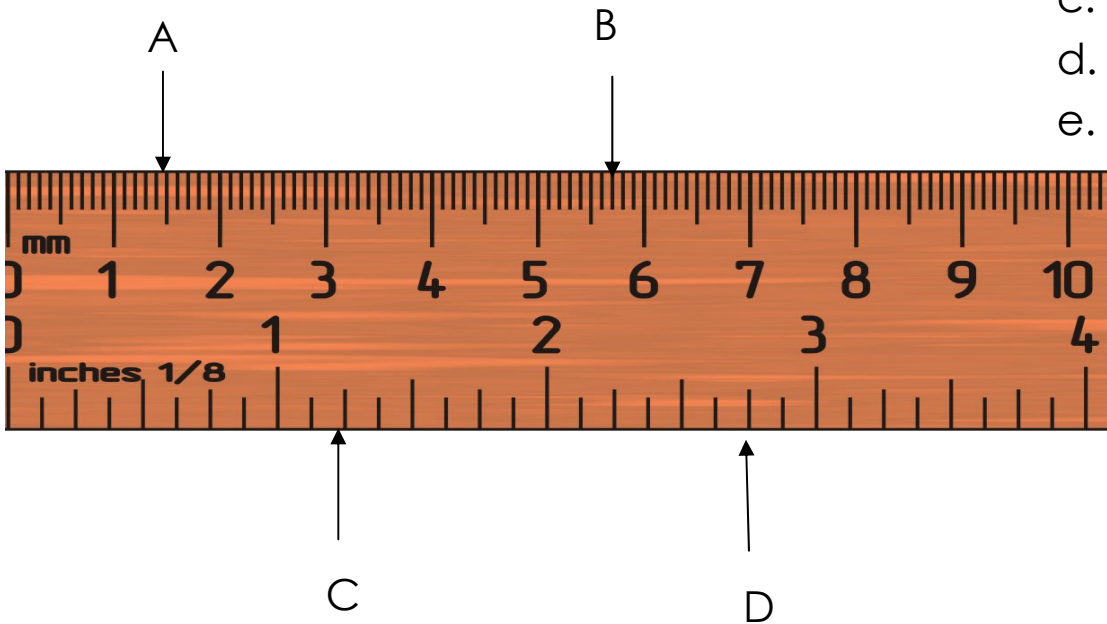


8. When the 16 tooth gear turn 4 times, how many times does the 8-tooth gear turn?
- a. 2
 - b. 4
 - c. 8
 - d. 16
 - e. *none of these*

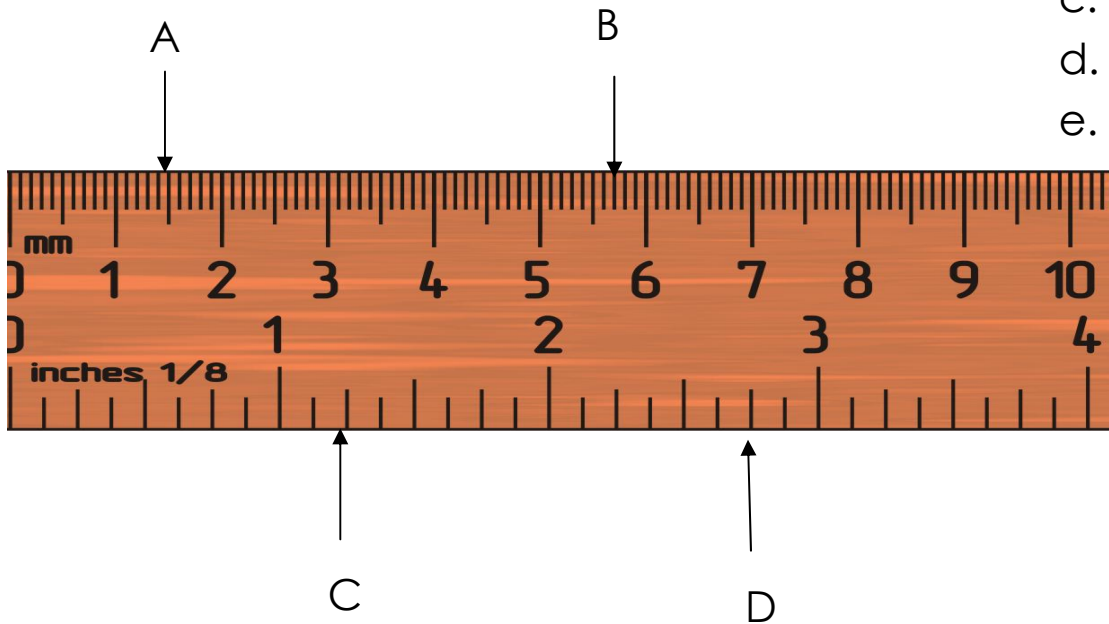


9. When the large wheel has made 40 complete turns, how many has the small wheel made?
- a. 20
 - b. 40
 - c. 50
 - d. 60
 - e. *none of these*

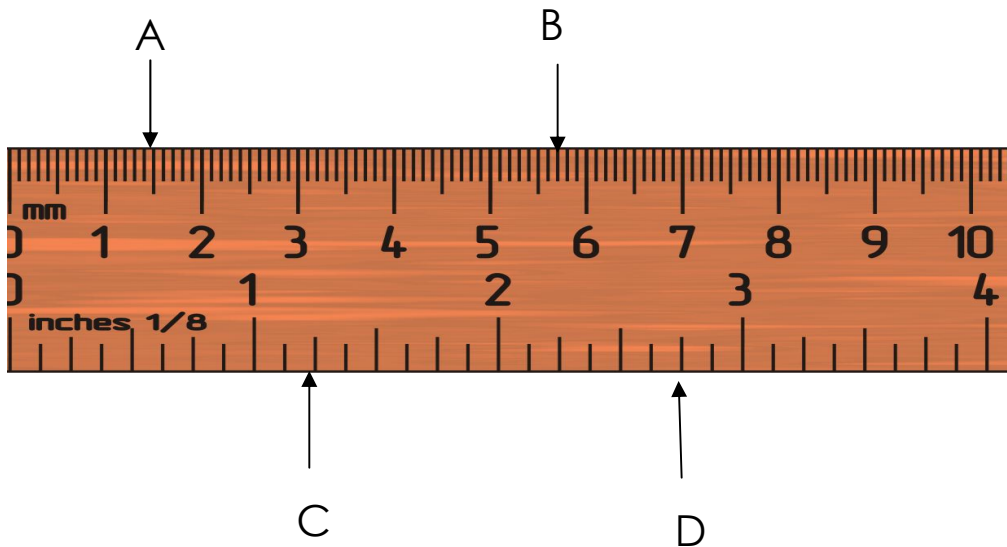
10. What is the reading at C?
- a. 1.25 inches
 - b. 1.50 inches
 - c. 1.60 inches
 - d. 1.75 inches
 - e. *none of these*



11. How much larger is D than C?
- a. 1.00 inches
 - b. 1.25 inches
 - c. 1.50 inches
 - d. 1.75 inches
 - e. *none of these*



12. How much is the reading at A multiplied by the reading at B?
- a. 0.855 square centimeters
 - b. 8.55 square centimeters
 - c. 85.5 square centimeters
 - d. 855 square centimeters
 - e. *none of these*



Answers and Explanations



1. What is the total length of the three pipes?
 - a. 256 inches
 - b. 306 inches
 - c. 356 inches
 - d. 416 inches
 - e. *none of these*

How to Solve:

Add the lengths of A, B and C

$$132 + 168 + 56 = 356.$$

The correct answer is c.

A 
132 inches

B 
168 inches

C 
56 inches

2. How long is A?
- a. 11 feet
 - b. 12 feet
 - c. 14 feet
 - d. 16 feet
 - e. *none of these*

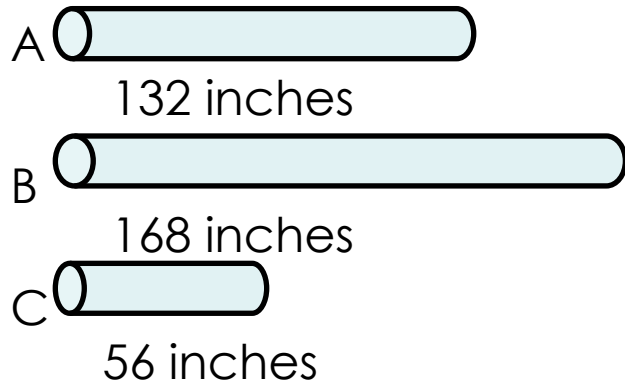
How to Solve

To convert inches to feet, divide the number of inches by 12.

$$X \text{ inches} / 12 \text{ inches per foot} = x \text{ feet}$$

$$132 / 12 = 11$$

The correct answer is a.



3. B is how many times as long as C?
- a. 2.0
 - b. 2.5
 - c. 3.0
 - d. 3.5
 - e. *none of these*

How to Solve

1. Set up an equation.
2. Divide both sides of the equation by C to get the unknown by itself.
3. Plug the numbers into the equation to solve for ?

$$B = ? \times C$$

$$B/C = ?$$

$$168/56 = 3$$

Tips:

Use = for "is, "

Use X or ? for "how many."

The correct answer is c.

A 
132 inches

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168 inches

C 
56 inches

4. What is the length of a pipe that is 75% as long as C?
- a. 75 inches
 - b. 64 inches
 - c. 53 inches
 - d. 42 inches
 - e. *none of these*

How to Solve

1. Set up an equation: $? = 75\% \times C$
2. Plug in the numbers: $? = \frac{3}{4} \times 56$
3. Solve: $? = 42$

Tips:

When you see “of”, multiply.

$75\% = .75$ or $\frac{3}{4}$.

Either way you get the same answer.

The correct answer is d.

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5. How many millimeters larger is the diameter of wire used in No. 7 sieves than that used in No. 12 sieves.
- 0.009
 - 0.230
 - 1.150
 - 1.230
 - none of these*

How to Solve

- Read the values off the table as shown.
- Subtract the value of No. 12 from No. 7.

The correct answer is b.

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6. What is the sieve opening, in inches, of a sieve in which the wire diameter is 0.033
- 2.38
 - 0.094
 - 0.84
 - 0.033
 - none of these*

How to Solve

- Read the value from the table. Be sure you are reading the correct row and column.

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7. What is the sieve opening, in millimeters, of a sieve that has $\frac{1}{2}$ the opening of a No. 6 sieve?
- 2.38
 - 2.00
 - 1.68
 - 1.41
 - none of these*

How to Solve

Find $\frac{1}{4}$ of 3.36.

$$3.36/4 = 0.84.$$

This not one of the choices.

The correct answer is e.



8. When the 16 tooth gear turn 4 times, how many times does the 8-tooth gear turn?
- a. 2
 - b. 4
 - c. 8
 - d. 16
 - e. none of these

How to Solve

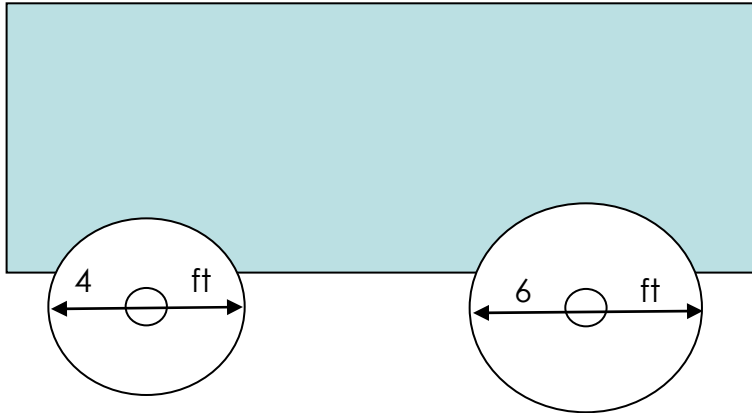
Step One: Set up an equation.

Every time the large gear turns once, the small gear turns twice.

The correct answer is c.

4 turns of large x 2 = small gear turns

$$4 \times 2 = 8$$



10. When the large wheel has made 40 complete turns, how many has the small wheel made?
- a. 20
 - b. 40
 - c. 50
 - d. 60
 - e. *none of these*

How to Solve

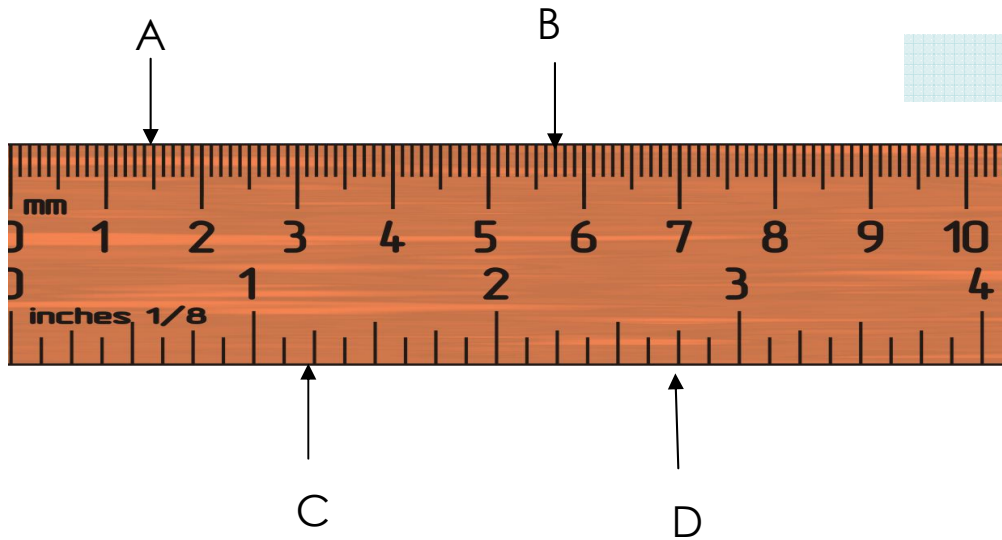
Set up a proportion

Divide both sides by 4.

The correct answer is d.

$$6 \times 40 = 4 \times ?$$

$$\frac{6 \times 40}{4} = 60$$



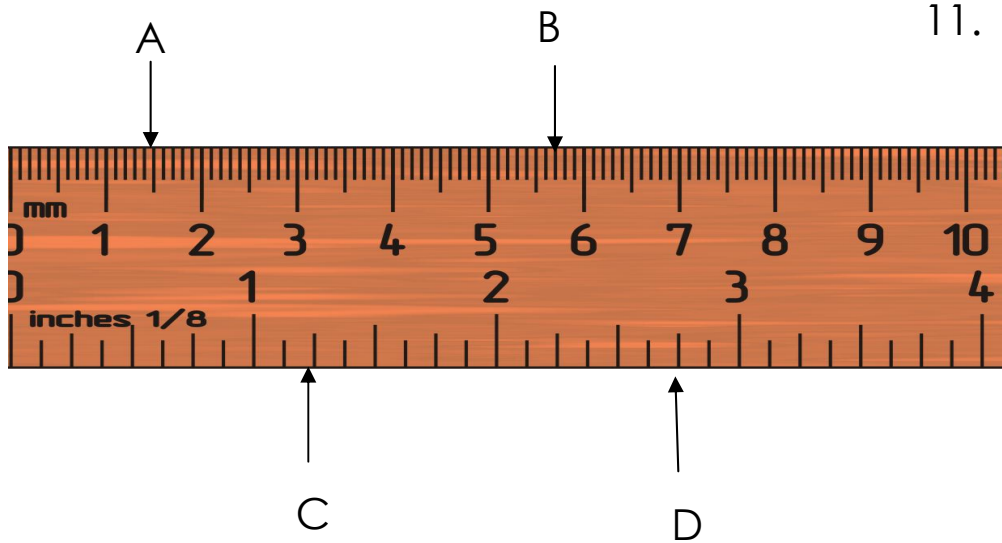
10. What is the reading at C?
- a. 1.25 inches
 - b. 1.50 inches
 - c. 1.60 inches
 - d. 1.75 inches
 - e. *none of these*

How to Solve

Read the scale.

Each inch is divided by hash marks showing $\frac{1}{2}$, $\frac{1}{4}$, and $\frac{1}{8}$.

The correct answer is a.

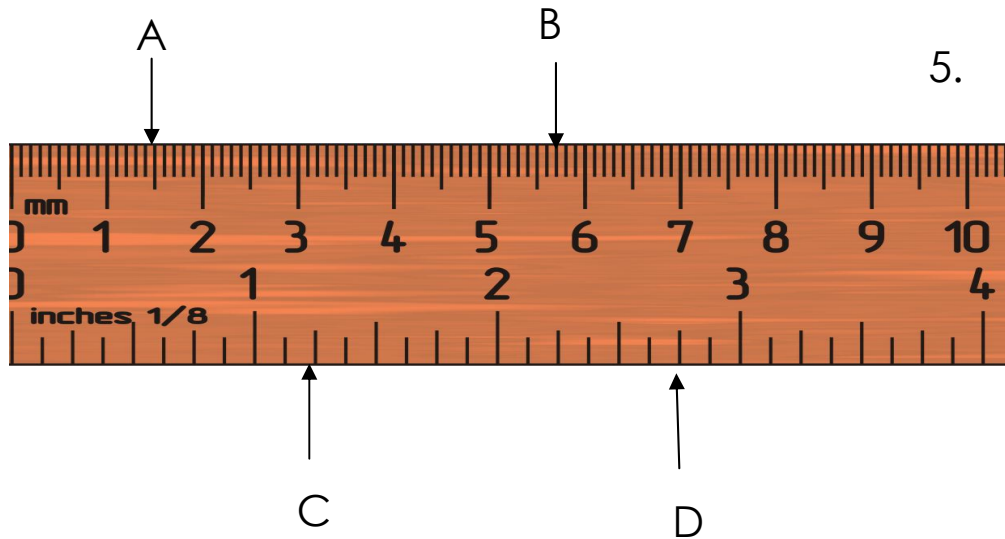


11. How much larger is D than C?
- a. 1.00 inches
 - b. 1.25 inches
 - c. 1.50 inches
 - d. 1.75 inches
 - e. none of these

How to Solve

Subtract the value of C from D.

The correct answer is c.



5.

How much is the reading at A multiplied by the reading at B?

- a. 0.855 square centimeters
- b. 8.55 square centimeters
- c. 85.5 square centimeters
- d. 855 square centimeters
- e. none of these

How to Solve

Multiply 1.5 cm (A) x 5.7 cm (B).

Remember when you multiply decimals, you count the number of decimal places in the numbers you are multiplying together.

This number will give you the right number of decimal places in the answer.

$$1.5 \times 5.7 = 8.55$$

Tip:

All of the answer choices are the same, except for the decimal place.

You can estimate—almost 6×1.5 should be a little less than 9.

This estimate is close enough to eliminate a, c and d.

Answer Key

1. c

2. a

3. c

4. d

5. b

6. b

7. c

8. c

9. d

10. a

11. c

12. b

You have completed Part I of the Process Operator Exam Shop Arithmetic Self Study Practice.

Your next step is to work through Part II.