Math Drill

Time yourself from start to finish and record your time below. The SAT Non-Calculator section is all about speed and practice makes perfect!

YOUR TIME: _____

Dividing by 1 to 12 (A)

Name: _____ Date: _____ Score: _____

Calculate each quotient.

110 ÷ 10 =	28 ÷ 7 =	20 ÷ 2 =	18 ÷ 2 =
99 ÷ 11 =	24 ÷ 6 =	72 ÷ 12 =	24 ÷ 12 =
64 ÷ 8 =	11 ÷ 11 =	60 ÷ 12 =	60 ÷ 10 =
100 ÷ 10 =	36 ÷ 9 =	110 ÷ 11 =	36 ÷ 12 =
96 ÷ 12 =	14 ÷ 7 =	33 ÷ 3 =	6 ÷ 6 =
80 ÷ 8 =	24 ÷ 4 =	72 ÷ 9 =	9 ÷ 9 =
90 ÷ 10 =	10 ÷ 2 =	42 ÷ 7 =	45 ÷ 9 =
72 ÷ 8 =	16 ÷ 2 =	77 ÷ 11 =	27 ÷ 3 =
132 ÷ 12 =	55 ÷ 11 =	30 ÷ 6 =	77 ÷ 7 =
108 ÷ 9 =	108 ÷ 12 =	96 ÷ 8 =	50 ÷ 5 =
88 ÷ 8 =	99 ÷ 9 =	120 ÷ 10 =	9 ÷ 1 =
144 ÷ 12 =	15 ÷ 5 =	14 ÷ 2 =	21 ÷ 3 =
88 ÷ 11 =	16 ÷ 4 =	66 ÷ 6 =	12 ÷ 2 =
81 ÷ 9 =	32 ÷ 8 =	66 ÷ 11 =	42 ÷ 6 =
84 ÷ 12 =	3 ÷ 1 =	12 ÷ 3 =	50 ÷ 10 =
27 ÷ 9 =	40 ÷ 8 =	12 ÷ 4 =	20 ÷ 5 =
30 ÷ 3 =	6 ÷ 3 =	10 ÷ 5 =	70 ÷ 7 =
11 ÷ 1 =	4 ÷ 4 =	120 ÷ 12 =	63 ÷ 7 =
24 ÷ 2 =	132 ÷ 11 =	6 ÷ 2 =	33 ÷ 11 =
80 ÷ 10 =	25 ÷ 5 =	48 ÷ 12 =	18 ÷ 3 =
28 ÷ 4 =	32 ÷ 4 =	44 ÷ 4 =	54 ÷ 6 =
5 ÷ 1 =	40 ÷ 5 =	48 ÷ 8 =	21 ÷ 7 =
121 ÷ 11 =	16 ÷ 8 =	30 ÷ 5 =	30 ÷ 10 =
10 ÷ 1 =	18 ÷ 9 =	8 ÷ 2 =	12 ÷ 1 =
90 ÷ 9 =	35 ÷ 5 =	72 ÷ 6 =	48 ÷ 4 =

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Unit 14 - Rational Expressions

Topic: Rational Expressions

1

If $n \neq 4$, which of the following is equivalent to $\frac{n^2}{n-4}+\frac{4n}{4-n}$?

A) n

B) $\frac{n(n+4)}{n-4}$

C) $\frac{n}{n-4}$

D) $\frac{n+4}{n-4}$

2

If $a \neq \pm 1$, which of the following is equivalent to $\frac{a}{a^2-1}-\frac{1}{a+1}$?

A) $\frac{1}{a-1}$

B) $\frac{1}{a+1}$

C) $\frac{2a-1}{a^2-1}$

D) $\frac{1}{a^2-1}$

3

If $y \neq -1$ and $y \neq 0$, which of the following is equivalent to $\frac{y^2-1}{1+\frac{1}{y}}$?

A) $\frac{y-1}{y}$

B) $y(y-1)$

C) $\frac{y}{y+1}$

D) $y-1$

4

If $x \neq \pm 1$, which of the following is equivalent to $\frac{1-\frac{1}{x+1}}{1+\frac{1}{x^2-1}}$?

A) $\frac{x-1}{x}$

B) $\frac{x+1}{x}$

C) $\frac{x-1}{x^2}$

D) $\frac{x+1}{x^2}$

5

If $x > 3$, which of the following is equivalent to $\frac{x-3}{\frac{1}{x+2}-\frac{1}{2x-1}}$?

A) $\frac{x-3}{(x+2)(2x-1)}$

B) $\frac{(x+2)(2x-1)}{x-3}$

C) $(x+2)(2x-1)$

D) $2x-1$

6

If $\frac{x^2-xy}{2x} \div \frac{x-y}{3x^2} = ax^2$, what is the value of a?

Topic: Solving Rational Equations

1

$$\frac{x}{x-1}=\frac{x-2}{x+1}$$

What is the solution set of the equation above?

A) -2

B) $-\frac{1}{2}$

C) $\frac{1}{2}$

D) 2

2

$$\frac{x}{x-3}-2=\frac{4}{x-2}$$

What is the solution set of the equation above?

A) $\{0\}$

B) $\{2\}$

C) $\{0, 2\}$

D) $\{0, 4\}$

3

$$\frac{1}{x}-\frac{2}{x-2}=\frac{-4}{x^2-2x}$$

What is the solution set of the equation above?

A) -2

B) 0

C) 2

D) There is no solution to the equation.

4

$$\frac{3}{x^2-3x}+\frac{1}{3-x}=2$$

What is the solution set of the equation above?

A) $\{-\frac{1}{2}\}$

B) $\{3\}$

C) $\{-\frac{1}{2}, 3\}$

D) $\{-\frac{1}{2}, -3\}$

5

If $f(x)=\frac{1}{(x-a)^2-4(x-a)+4}$ is undefined when $x=6$, what is the value of a?

6

$$g(x)=\frac{1}{(x+3)^2-24(x+3)+144}$$

For what value of x is function g above undefined?

Topic: Direct, Inverse, and Joint Variations

1

Which of the following tables shows a relationship in which y is directly proportional to x?

A)

x	−2	0	2
y	−1	1	3

B)

x	−2	0	2
y	5	0	−5

C)

x	−2	0	2
y	−3	1	5

D)

x	−2	0	2
y	3	1	−1

2

The distance it takes an automobile to stop varies directly as the square of its speed. If the stopping distance of a car traveling at 40 mph is 320 feet, what is the stopping distance of a car traveling at 50mph?

A) 360 ft

B) 420 ft

C) 500 ft

D) 580 ft

3

If y varies inversely as $\sqrt{x}$, and $y=12$ when $x=16$, what is the value of y when $x=100$?

A) 1.2

B) 3

C) 4.8

D) 6.4

Questions 4 and 5 refer to the following information.

$$L=\frac{k}{d^2}$$

The formula above shows the brightness of the light of an object, which varies inversely as the square of the distance. L, measured in lumens, is the brightness of the light and d, measured in meters, is the distance from the object to the light source.

4

At distance 2 meters from a light source, the brightness of an object was measured at 9 lumens. What is the value of k?

A) 18

B) 24

C) 32

D) 36

5

The brightness of an object was measured d meters away from a light source. The brightness of the same object was measured $1.5d$ meters from the light source. What is the ratio of brightness of the object when it is close to the light source to when it is farther away from the light source?

A) $\frac{9}{4}$

B) $\frac{5}{2}$

C) $\frac{7}{4}$

D) $\frac{3}{2}$

Topic: Solving Word Problems Using Rational Equations

Questions 1 and 2 refer to the following information.

$$\frac{1}{4}+\frac{1}{6}=\frac{1}{x}$$

Working alone, a painter can paint a house in four days. Working alone, his assistant can paint the same house in six days. Working together, they can finish painting the house in x days. The equation above represents the situation described.

1

Which of the following describes what $\frac{1}{x}$ represents in the above equation?

A) The portion of the job that the painter can finish in one day.

B) The portion of the job that the assistant can finish in one day.

C) The portion of the job that the painter and assistant together can finish in one day.

D) The portion of the job that the painter and assistant together can finish in four days.

2

How many days will it take them to finish painting the house working together?

A) $1\frac{4}{5}$

B) $2\frac{2}{5}$

C) $2\frac{4}{5}$

D) $3\frac{1}{5}$

3

Three printers A, B, and C, working together at their respective constant rates, can finish a job in 4.5 hours. Printers A and B, working together, can finish the same job in 6 hours. How many hours will it take printer C, working alone, to finish the job?

A) 12.5

B) 14

C) 16.5

D) 18

4

Mike can do a job in 48 minutes. If his brother helps him, it takes them 32 minutes. How many minutes does it take Mike's brother to do the job alone?

A) 72

B) 80

C) 96

D) 102

5

James can do a job in 8 hours and Peter can do the same job in 5 hours. If they finished $\frac{13}{25}$ of the job by working together, how long did they work together?

A) 1 hour 24 minutes

B) 1 hour 36 minutes

C) 1 hour 48 minutes

D) 2 hours 8 minutes

Unit 14 Review Questions

1

If $a \neq b$, which of the following is equivalent to $\frac{a}{a-b}+\frac{b}{b-a}$?

A) 1

B) $\frac{a+b}{a-b}$

C) $\frac{a+b}{(a-b)^2}$

D) $\frac{a^2+b^2}{(a-b)^2}$

2

If $x>0$ and $y>0$, which of the following is equivalent to $\frac{\frac{1}{x}-\frac{1}{y}}{\frac{1}{x^2}-\frac{1}{y^2}}$?

A) $\frac{xy}{x^2-y^2}$

B) $\frac{2xy}{x^2-y^2}$

C) $\frac{xy}{x+y}$

D) $\frac{xy}{x-y}$

3

$$\frac{(k+1)^2}{k}=4k$$

What is the solution set of the equation above?

A) $\{-\frac{1}{3}\}$

B) $\{-1\}$

C) $\{-\frac{1}{3},1\}$

D) $\{\frac{1}{3},-1\}$

4

$$\frac{3}{x}-\frac{x}{x+2}=\frac{2}{x+2}$$

What is the solution set of the equation above?

A) $\{2,\ -3\}$

B) $\{-2,\ 3\}$

C) $\{-2\}$

D) $\{3\}$

5

$$\frac{x}{x+1}+\frac{4}{x-4}=\frac{20}{x^2-3x-4}$$

What is the solution set of the equation above?

A) $\{-4\}$

B) $\{4\}$

C) $\{-4,\ 4\}$

D) There are no solutions to the equation.

6

If $x \neq \pm 1$, which of the following is equivalent to $\dfrac{1+\dfrac{1}{x-1}}{1-\dfrac{1}{x+1}}$?

A) $\dfrac{x-1}{x+1}$

B) $\dfrac{x+1}{x-1}$

C) $\dfrac{x^2-1}{x^2+1}$

D) $\dfrac{x^2+1}{x^2-1}$

7

Working alone, Gary can load an empty truck in 3 hours. Working alone, his brother can load the same truck in x hours. If Gary and his brother worked together for t hours to load the empty truck, which of the following equations can be used to find out how much work was done during t hours?

A) $\dfrac{3}{t}+xt$

B) $\dfrac{3}{t}+\dfrac{x}{t}$

C) $3t+xt$

D) $\dfrac{1}{3}t+\dfrac{1}{x}t$

8

$$f(x)=\frac{5}{2(x-2)^2-3(x-2)-2}$$

What is one possible value of x, if function f is undefined?

9

If $x>0$, what is the solution to the equation $\dfrac{1}{2x}+\dfrac{3}{10x^2}=\dfrac{1}{5}$?

10

If $a \neq b$ and $\dfrac{ab}{a-b} \div \dfrac{ab^2}{b-a}=-\dfrac{1}{6}$, what is the value of b?

11

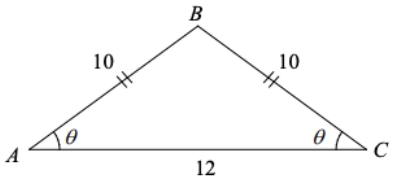
If $\dfrac{a+\dfrac{1}{2}}{a-\dfrac{1}{2}}=2$, what is the value of a?

Unit 15 - Trigonometric Functions

Topic: Trigonometric Ratios of Acute Angles

Questions 1- 3 refer to the following information.

In the triangle shown below $AB = BC = 10$ and $AC = 12$.



1

What is the value of $\cos\theta$?

A) 0.4
B) 0.6
C) 0.8
D) 1.2

2

What is the value of $\sin\theta$?

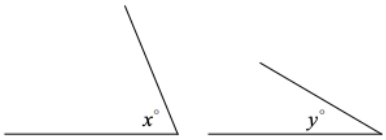
A) 0.4
B) 0.6
C) 0.8
D) 1.2

3

What is the value of $\tan\theta$?

A) $\frac{3}{4}$
B) $\frac{4}{3}$
C) $\frac{5}{4}$
D) $\frac{5}{3}$

4

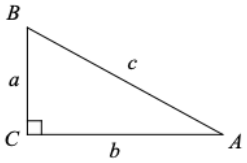


Note: Figures not drawn to scale.

In the figures above $y < x < 90$ and $\cos x^\circ = \sin y^\circ$. If $x = 3a - 14$ and $y = 50 - a$, what is the value of a?

A) 16
B) 21
C) 24
D) 27

5



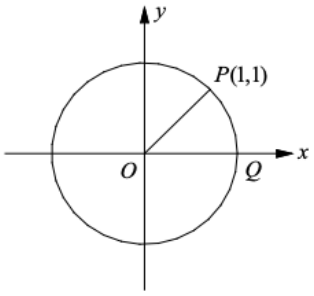
Given the right triangle ABC above, which of the following is equal to $\frac{a}{c}$?

I. $\sin A$
II. $\cos B$
III. $\tan A$

A) I only
B) II only
C) I and II only
D) II and III only

Topic: The Radian Measure of an Angle

1



In the xy- plane above, O is the center of the circle, and the measure of $\angle POQ$ is $k\pi$ radians. What is the value of k ?

A) $\frac{1}{6}$

B) $\frac{1}{4}$

C) $\frac{1}{3}$

D) $\frac{1}{2}$

2

Which of the following is equal to $\cos(\frac{\pi}{8})$?

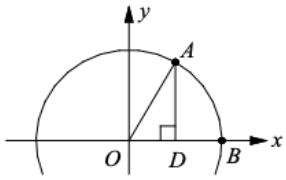
A) $\cos(\frac{3\pi}{8})$

B) $\cos(\frac{7\pi}{8})$

C) $\sin(\frac{3\pi}{8})$

D) $\sin(\frac{7\pi}{8})$

3



In the xy- plane above, O is the center of the circle and the measure of $\angle AOD$ is $\frac{\pi}{3}$. If the radius of circle O is 6 what is the length of AD ?

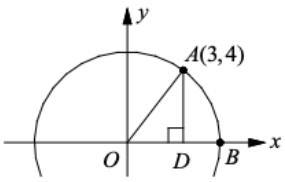
A) 3

B) $3\sqrt{2}$

C) 4.5

D) $3\sqrt{3}$

4



In the figure above, what is the value of $\cos\angle AOD$?

A) $\frac{3}{5}$

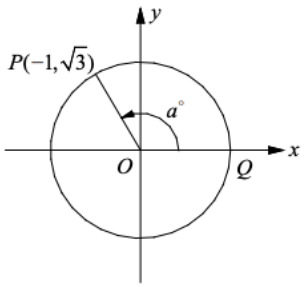
B) $\frac{3}{4}$

C) $\frac{4}{5}$

D) $\frac{4}{3}$

Topic: Trigonometric Functions and the Unit Circle

Questions 1 and 2 refer to the following information.



In the xy- plane above, O is the center of the circle, and the measure of $\angle POQ$ is a°.

1

What is the cosine of a°?

A) $-\frac{1}{2}$

B) $\sqrt{3}$

C) $-\frac{1}{\sqrt{3}}$

D) $\frac{\sqrt{3}}{2}$

2

What is the cosine of $(a+180)^\circ$?

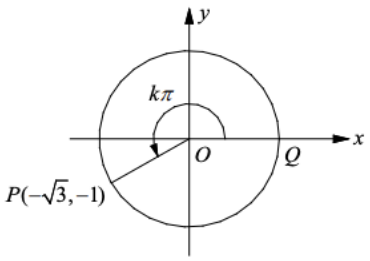
A) $-\sqrt{3}$

B) $-\frac{\sqrt{3}}{2}$

C) $\frac{1}{2}$

D) $\frac{1}{\sqrt{3}}$

Questions 3 and 4 refer to the following information.



In the xy- plane above, O is the center of the circle, and the measure of the angle shown is $k\pi$ radians.

3

What is the value of k?

A) $\frac{5}{6}$

B) $\frac{7}{6}$

C) $\frac{4}{3}$

D) $\frac{5}{3}$

4

What is the value of $\tan(k\pi)$?

A) $-\sqrt{3}$

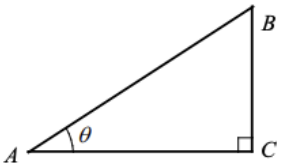
B) -1

C) $-\frac{1}{\sqrt{3}}$

D) $\frac{1}{\sqrt{3}}$

Unit 15 Review Questions

1



Note: Figure not drawn to scale.

In the right triangle shown above, if $\tan\theta = \frac{3}{4}$, what is $\sin\theta$?

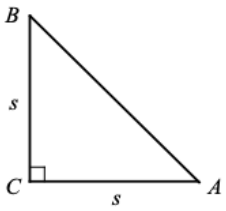
A) $\frac{1}{3}$

B) $\frac{1}{2}$

C) $\frac{4}{5}$

D) $\frac{3}{5}$

2



In the isosceles right triangle shown above, what is $\tan\angle A$?

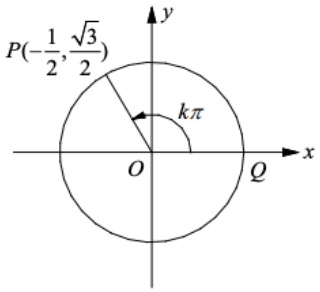
A) s

B) $\frac{1}{s}$

C) 1

D) $\frac{s}{\sqrt{2}}$

Questions 1 and 2 refer to the following information.



In the xy-plane above, O is the center of the circle, and the measure of $\angle POQ$ is $k\pi$ radians.

3

What is the value of k?

A) $\frac{1}{3}$

B) $\frac{1}{2}$

C) $\frac{2}{3}$

D) $\frac{3}{4}$

4

What is $\cos(k+1)\pi$?

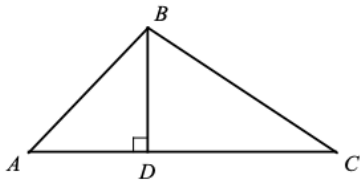
A) $\frac{1}{\sqrt{3}}$

B) $\frac{1}{2}$

C) $\frac{\sqrt{3}}{2}$

D) $\sqrt{3}$

5



In triangle ABC above, $\overline{AC} \perp \overline{BD}$. Which of the following does not represent the area of triangle ABC?

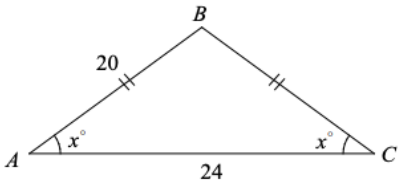
A) $\frac{1}{2}(AB\cos\angle A + BC\cos\angle C)(AB\cos\angle ABD)$

B) $\frac{1}{2}(AB\cos\angle A + BC\cos\angle C)(BC\sin\angle C)$

C) $\frac{1}{2}(AB\sin\angle ABD + BC\sin\angle CBD)(AB\sin\angle A)$

D) $\frac{1}{2}(AB\sin\angle ABD + BC\sin\angle CBD)(BC\cos\angle C)$

6



In the isosceles triangle above, what is the value of $\sin x^\circ$?

A) $\frac{1}{2}$

B) $\frac{3}{5}$

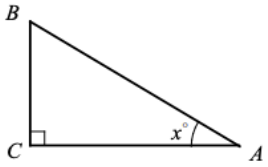
C) $\frac{2}{3}$

D) $\frac{4}{5}$

7

In triangle ABC, the measure of $\angle C$ is 90°, $AC = 24$, and $BC = 10$. What is the value of $\sin A$?

8



In the right triangle ABC above, the cosine of x° is $\frac{3}{5}$. If $BC = 12$, what is the length of AC?

9

If $\sin(5x-10)^\circ = \cos(3x+16)^\circ$, what is the value of x?