Math Practice - Grade 8

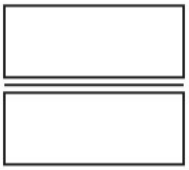
M1 Real numbers

M1 8.NS.A.1, 8.NS.A.2

Name: _____ Date: _____

Write a repeating decimal as a fraction. Tell whether a number is rational or irrational. Place an irrational number between two decimals on a number line.

1 Write 0.7777... as a fraction in lowest terms.



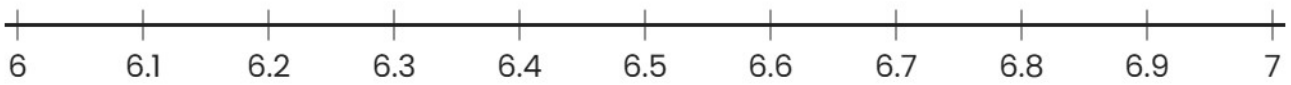
---

2 Is pi rational or irrational?

Rational | Irrational

---

3 Write two decimals, one below and one above the square root of 41.



Below _____ Above _____

Answer Key

1. 7/9 2. Irrational 3. 6.4 and 6.5

Math Practice - Grade 8

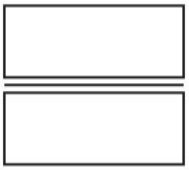
M1 Real numbers

M1 8.NS.A.1, 8.NS.A.2

Name: _____ Date: _____

Write a repeating decimal as a fraction. Tell whether a number is rational or irrational. Place an irrational number between two decimals on a number line.

1 **Write 0.6464... as a fraction in lowest terms.**



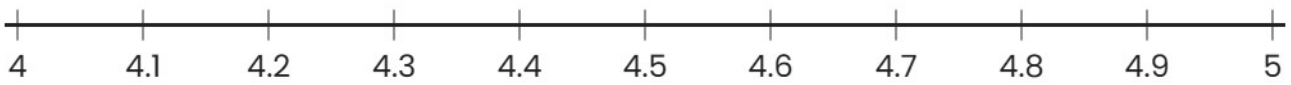
---

2 **Is the square root of 7 rational or irrational?**

Rational | Irrational

---

3 **Write two decimals, one below and one above the square root of 23.**



Below _____ Above _____

Answer Key

1. 64/99 2. Irrational 3. 4.7 and 4.8

Math Practice - Grade 8

M1 Real numbers

M1 8.NS.A.1, 8.NS.A.2

Name: _____ Date: _____

Write a repeating decimal as a fraction. Tell whether a number is rational or irrational. Place an irrational number between two decimals on a number line.

1 Write 0.2323... as a fraction in lowest terms.

$\frac{\square}{\square}$

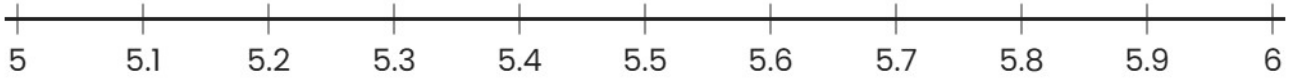
---

2 Is 1.5 rational or irrational?

Rational | Irrational

---

3 Write two decimals, one below and one above the square root of 32.



Below ☐ Above ☐

Answer Key

1. 23/99 2. Rational 3. 5.6 and 5.7

Math Practice - Grade 8

M2 Exponents, roots, scientific notation

M2 8.EE.A.1, 8.EE.A.2, 8.EE.A.3, 8.EE.A.4

Name: _____ Date: _____

Simplify a power of a power, a product of powers, or a quotient of powers. Find square roots and cube roots. Write a number in scientific notation and back. Add, subtract, multiply, and divide numbers in scientific notation.

1 **Simplify $2^3 \times 2^0$.**

$$2^3 \times 2^0 = \square$$

---

2 **Find the cube root of 512.**

$$\text{Cube root of } 512 = \square$$

---

3 **Write 9.4×10^5 as an ordinary number.**

$$9.4 \times 10^5 = \square$$

Answer Key

1. 2^3 2. 8 3. 940000

Math Practice - Grade 8

M2 Exponents, roots, scientific notation

M2 8.EE.A.1, 8.EE.A.2, 8.EE.A.3, 8.EE.A.4

Name: _____ Date: _____

Simplify a power of a power, a product of powers, or a quotient of powers. Find square roots and cube roots. Write a number in scientific notation and back. Add, subtract, multiply, and divide numbers in scientific notation.

1 **Simplify $4^{-2} / 4^{-3}$.**

$$4^{-2} / 4^{-3} = \square$$

---

2 **Find the cube root of 216.**

$$\text{Cube root of } 216 = \square$$

---

3 **Write 0.065 in scientific notation.**

$$0.065 = \square$$

Answer Key

1. 4^1 2. 6 3. 6.5×10^{-2}

Math Practice - Grade 8

M2 Exponents, roots, scientific notation

M2 8.EE.A.1, 8.EE.A.2, 8.EE.A.3, 8.EE.A.4

Name: _____ Date: _____

Simplify a power of a power, a product of powers, or a quotient of powers. Find square roots and cube roots. Write a number in scientific notation and back. Add, subtract, multiply, and divide numbers in scientific notation.

1 **Simplify $3^{-2} \times 3^{-1}$.**

$$3^{-2} \times 3^{-1} = \square$$

---

2 **Find the square root of 64.**

$$\text{Square root of } 64 = \square$$

---

3 **Write 0.51 in scientific notation.**

$$0.51 = \square$$

Answer Key

1. 1/27 2. 8 3. 5.1×10^{-1}

Math Practice - Grade 8

M3 Proportional relationships, slope, linear equations

M3 8.EE.B.5, 8.EE.B.6

Name: _____ Date: _____

Find the unit rate as the slope of a proportional relationship. Compare two proportional relationships. Find the slope as rise over run from a graph. Write the equation of a line.

1 **A car travels 16 miles in 2 hours. What is the unit rate in miles per hour?**

Miles per hour ☐

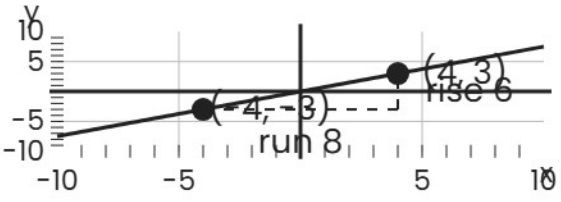
---

2 **Car A travels at 10 miles per hour. Car B travels 20 miles in 5 hours. Which car is faster?**

☐ Car A ☐ Car B

---

3 **Find the slope of the line. The two marked points are (-4, -3) and (4, 3).**



☐
☐

Answer Key

1. 8 2. Car A 3. 3/4

Math Practice - Grade 8

M3 Proportional relationships, slope, linear equations

M3 8.EE.B.5, 8.EE.B.6

Name: _____ Date: _____

Find the unit rate as the slope of a proportional relationship. Compare two proportional relationships. Find the slope as rise over run from a graph. Write the equation of a line.

1 **A car travels 25 miles in 5 hours. What is the unit rate in miles per hour?**

Miles per hour ☐

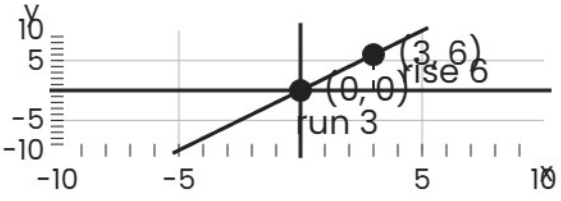
---

2 **Car A travels at 11 miles per hour. Car B travels 18 miles in 2 hours. Which car is faster?**

☐ Car A ☐ Car B

---

3 **Find the slope of the line. The two marked points are (0, 0) and (3, 6).**



☐

Answer Key

1. 5 2. Car A 3. 2

Math Practice - Grade 8

M3 Proportional relationships, slope, linear equations

M3 8.EE.B.5, 8.EE.B.6

Name: _____ Date: _____

Find the unit rate as the slope of a proportional relationship. Compare two proportional relationships. Find the slope as rise over run from a graph. Write the equation of a line.

1 **A car travels 42 miles in 6 hours. What is the unit rate in miles per hour?**

Miles per hour ☐

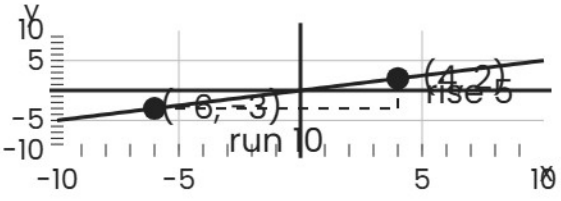
---

2 **Car A travels at 2 miles per hour. Car B travels 22 miles in 2 hours. Which car is faster?**

☐ Car A ☐ Car B

---

3 **Find the slope of the line. The two marked points are (-6, -3) and (4, 2).**



☐

Answer Key

1. 7 2. Car B 3. 1/2

Math Practice - Grade 8

M4 Solving linear equations

M4 8.EE.C.7, 8.EE.C.7a, 8.EE.C.7b

Name: _____ Date: _____

Solve a linear equation in one variable. Tell whether an equation has one solution, no solution, or infinitely many solutions. Solve equations with the distributive property and with like terms on both sides.

1 **Solve 2/4x + 9 = 12.**

$$2/4x + 9 = 12,\ x = \square$$

---

2 **How many solutions does 2x + 7 = 27 have?**

$$2x + 7 = 27$$

One solution	No solution	Infinitely many solutions

---

3 **Solve 7(x + 7) + 9 = 135.**

$$7(x + 7) + 9 = 135,\ x = \square$$

Answer Key

1. 6 2. One solution 3. 11

Math Practice - Grade 8

M4 Solving linear equations

M4 8.EE.C.7, 8.EE.C.7a, 8.EE.C.7b

Name: _____ Date: _____

Solve a linear equation in one variable. Tell whether an equation has one solution, no solution, or infinitely many solutions. Solve equations with the distributive property and with like terms on both sides.

1 **Solve 1/2x + 1 = 7.**

$$1/2x + 1 = 7, x = \square$$

---

2 **How many solutions does 5x + 3 = 58 have?**

$$5x + 3 = 58$$

One solution	No solution	Infinitely many solutions

---

3 **Solve 9(x + 9) + 6 = 159.**

$$9(x + 9) + 6 = 159, x = \square$$

Answer Key

1. 12 2. One solution 3. 8

Math Practice - Grade 8

M4 Solving linear equations

M4 8.EE.C.7, 8.EE.C.7a, 8.EE.C.7b

Name: _____ Date: _____

Solve a linear equation in one variable. Tell whether an equation has one solution, no solution, or infinitely many solutions. Solve equations with the distributive property and with like terms on both sides.

1 **Solve 2/4x + 5 = 10.**

$$2/4x + 5 = 10,\ x = \square$$

---

2 **How many solutions does 8x + 12 = 8x + 13 have?**

$$8x + 12 = 8x + 13$$

One solution	No solution	Infinitely many solutions

---

3 **Solve 8(x + 1) = 40.**

$$8(x + 1) = 40,\ x = \square$$

Answer Key

1. 10 2. No solution 3. 4

Math Practice - Grade 8

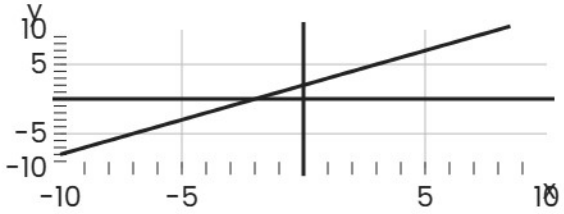
M5 Functions

M5 8.F.A.1, 8.F.A.2, 8.F.A.3

Name: _____ Date: _____

Tell whether a table or a graph is a function. Compare two functions by their rate of change. Tell whether a function is linear or nonlinear from a table, a graph, or an equation.

1 **Is the graph a function?**



Function | Not a function

---

2 **Function A is shown in the table. Function B is y = 3x. Which function has the greater rate of change?**

x	y
0	4
1	8
2	12

Function B: y = 3x

Function A | Function B

---

3 **Is y = 4x + 1 linear or nonlinear?**

Linear | Nonlinear

Answer Key

1. Function 2. Function A 3. Linear

Math Practice - Grade 8

M5 Functions

M5 8.F.A.1, 8.F.A.2, 8.F.A.3

Name: _____ Date: _____

Tell whether a table or a graph is a function. Compare two functions by their rate of change. Tell whether a function is linear or nonlinear from a table, a graph, or an equation.

1 Is the table a function?

x	y
1	3
2	11
3	7
4	6

Function | Not a function

---

2 Function A is shown in the table. Function B is y = 5x + 1. Which function has the greater rate of change?

x	y
0	1
1	3
2	5

Function B: y = 5x + 1

Function A | Function B

---

3 Is the function in the table linear or nonlinear?

x	y
0	5
1	7
2	9
3	11

Linear | Nonlinear

Answer Key

1. Function 2. Function B 3. Linear

Math Practice - Grade 8

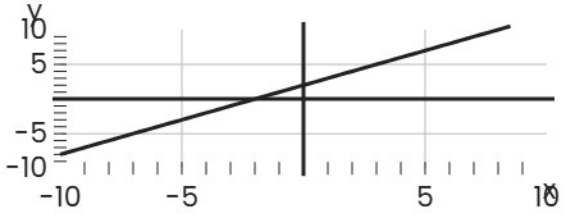
M5 Functions

M5 8.F.A.1, 8.F.A.2, 8.F.A.3

Name: _____ Date: _____

Tell whether a table or a graph is a function. Compare two functions by their rate of change. Tell whether a function is linear or nonlinear from a table, a graph, or an equation.

1 **Is the graph a function?**



Function | Not a function

---

2 **Function A is shown in the table. Function B is y = x + 5. Which function has the greater rate of change?**

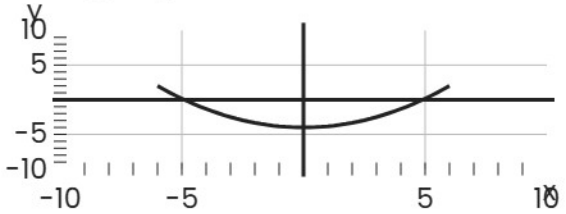
x	y
0	5
1	7
2	9

Function B: y = x + 5

Function A | Function B

---

3 **Is the function in the graph linear or nonlinear?**



Linear | Nonlinear

Answer Key

1. Function 2. Function A 3. Nonlinear

Math Practice - Grade 8

M6 Linear functions and modeling

M6 8.F.B.4, 8.F.B.5

Name: _____ Date: _____

Find the rate of change and the initial value from a description, a table, or a graph. Pick the graph that matches a story. Describe a graph in words: increasing, decreasing, flat, steep.

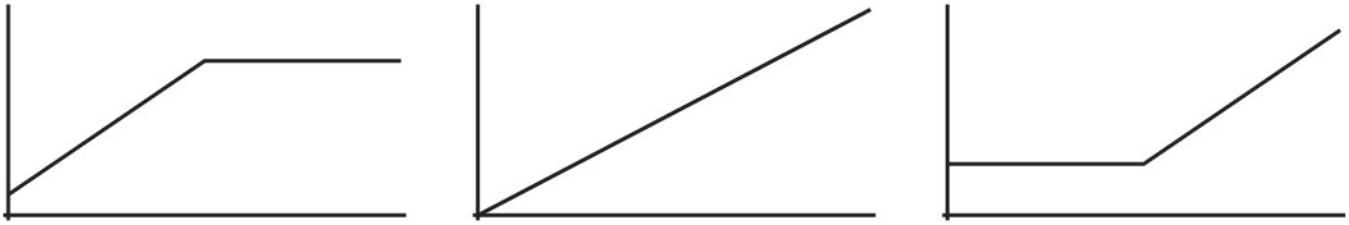
1 **Mia has 13 saved and saves 2 each week. What is the initial value? What is the rate of change?**

Initial value ☐

Rate of change ☐

---

2 **Water fills a tank, then the tap is turned off. Which graph matches the story?**



A **B** **C**

---

3 **Describe the graph.**



Increasing	Flat then increasing	Increasing then flat	Increasing then decreasing

Answer Key

1. Initial value 13, rate 2
2. Graph A
3. Increasing

Math Practice - Grade 8

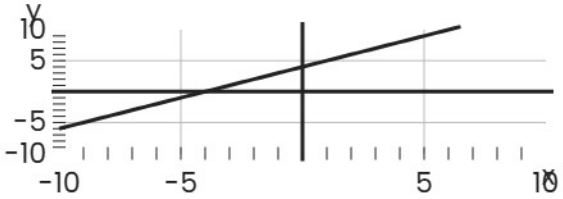
M6 Linear functions and modeling

M6 8.F.B.4, 8.F.B.5

Name: _____ Date: _____

Find the rate of change and the initial value from a description, a table, or a graph. Pick the graph that matches a story. Describe a graph in words: increasing, decreasing, flat, steep.

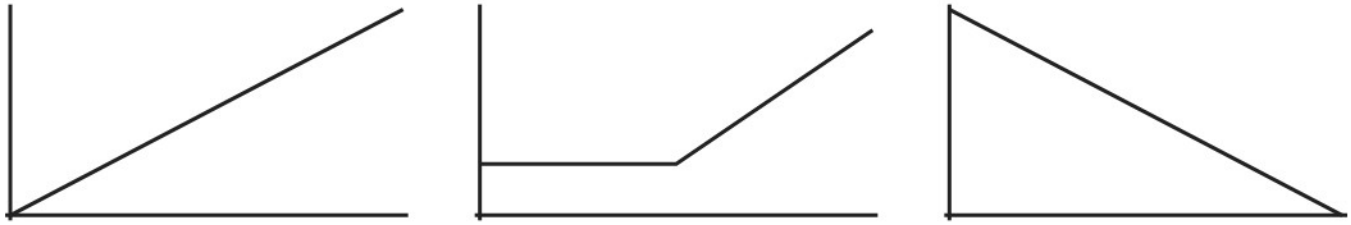
1 **Find the initial value and the rate of change from the graph.**



Initial value ☐

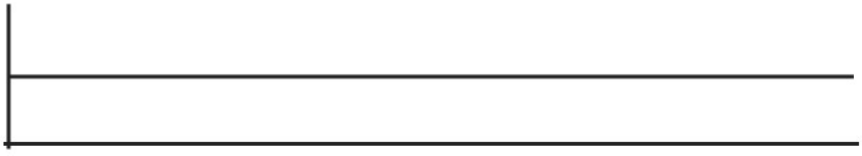
Rate of change ☐

2 **Mia rests, then walks home at a steady speed. Which graph matches the story?**



A **B** **C**

3 **Describe the graph.**



Flat	Increasing then decreasing	Flat then increasing	Increasing

Answer Key

1. Initial value 4, rate 1 2. Graph B 3. Flat

Math Practice - Grade 8

M6 Linear functions and modeling

M6 8.F.B.4, 8.F.B.5

Name: _____ Date: _____

Find the rate of change and the initial value from a description, a table, or a graph. Pick the graph that matches a story. Describe a graph in words: increasing, decreasing, flat, steep.

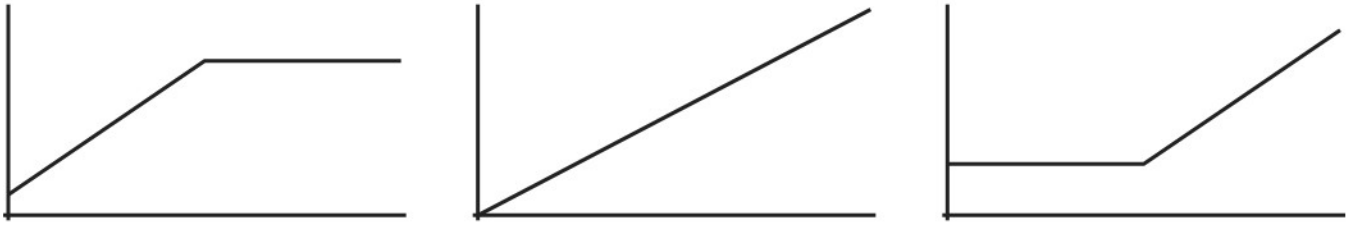
1 **Find the initial value and the rate of change from the table.**

x	y
0	8
1	9
2	10
3	11

Initial value ☐

Rate of change ☐

2 **A car drives at a steady speed. Which graph matches the story?**



A **B** **C**

3 **Describe the graph.**



Increasing then flat	Decreasing	Flat then increasing	Increasing then decreasing

Answer Key

1. Initial value 8, rate 1
2. Graph B
3. Increasing then flat

Math Practice - Grade 8

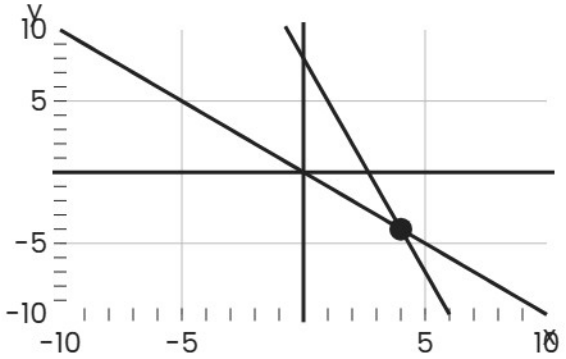
M7 Systems of two linear equations

M7 8.EE.C.8, 8.EE.C.8a, 8.EE.C.8b, 8.EE.C.8c

Name: _____ Date: _____

Find the point where two lines cross on a graph. Solve a system by substitution or elimination. Tell whether a system has one solution, no solution, or infinitely many solutions. Solve a real problem with two unknowns.

1 **Find the point where the two lines cross.**



Solution ☐

---

2 **Solve the system by substitution.**

$$y = -x - 1$$

$$4x + y = -7$$

☐

Answer Key

1. (4, -4) 2. (-2, 1)

Math Practice - Grade 8

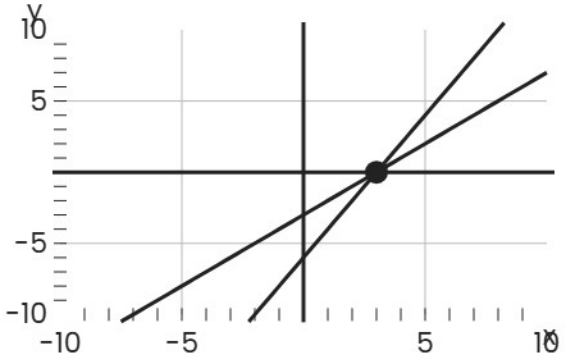
M7 Systems of two linear equations

M7 8.EE.C.8, 8.EE.C.8a, 8.EE.C.8b, 8.EE.C.8c

Name: _____ Date: _____

Find the point where two lines cross on a graph. Solve a system by substitution or elimination. Tell whether a system has one solution, no solution, or infinitely many solutions. Solve a real problem with two unknowns.

1 **Find the point where the two lines cross.**



Solution ☐

---

2 **Solve the system by elimination.**

$$x + 2y = 9$$

$$-3x - 5y = -25$$

☐

Answer Key

1. (3, 0) 2. (5, 2)

Math Practice - Grade 8

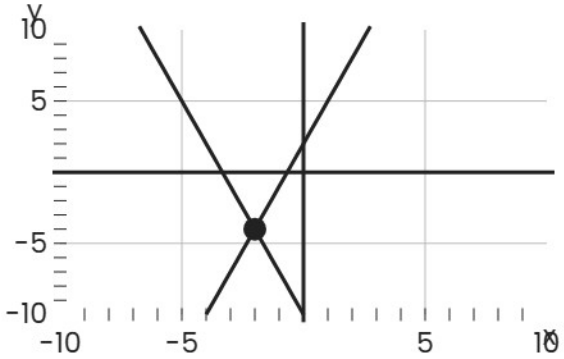
M7 Systems of two linear equations

M7 8.EE.C.8, 8.EE.C.8a, 8.EE.C.8b, 8.EE.C.8c

Name: _____ Date: _____

Find the point where two lines cross on a graph. Solve a system by substitution or elimination. Tell whether a system has one solution, no solution, or infinitely many solutions. Solve a real problem with two unknowns.

1 **Find the point where the two lines cross.**



Solution ☐

---

2 **Solve the system by elimination.**

$$2x + 5y = 23$$

$$-x + 1y = 6$$

☐

Answer Key

1. (-2, -4) 2. (-1, 5)

Math Practice - Grade 8

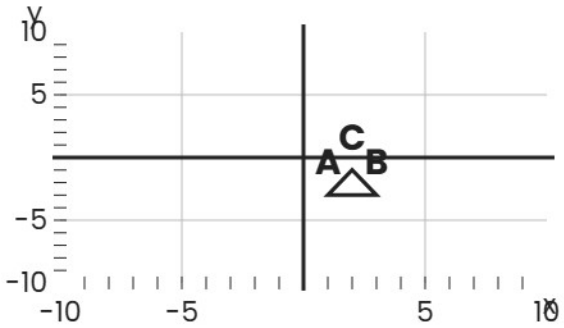
M8 Transformations, congruence, similarity

M8 8.G.A.1, 8.G.A.2, 8.G.A.3, 8.G.A.4

Name: _____ Date: _____

Translate, rotate, reflect, or dilate a figure on a coordinate grid and write the new coordinates. Name the sequence of moves that takes one figure to another. Tell whether two figures are congruent or similar and give the scale factor.

1 Reflect the triangle over the x-axis. Write the new coordinates of point B.



Point B ☐

---

2 Which sequence of moves takes figure 1 to figure 2?

Figure 1

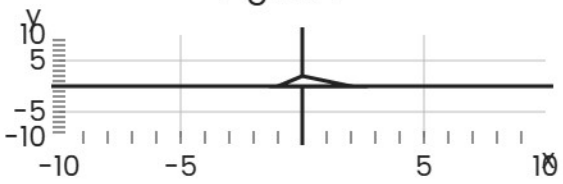
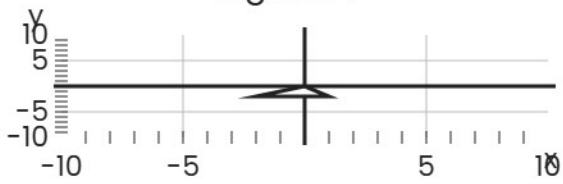


Figure 2



A. Reflect over the x-axis, then rotate 180 degrees
B. Translate 3 right, then reflect over the x-axis
C. Reflect over the y-axis, then translate 2 down

Answer Key

1. (3, 3)

2. Reflect over the y-axis, then translate 2 down

Math Practice - Grade 8

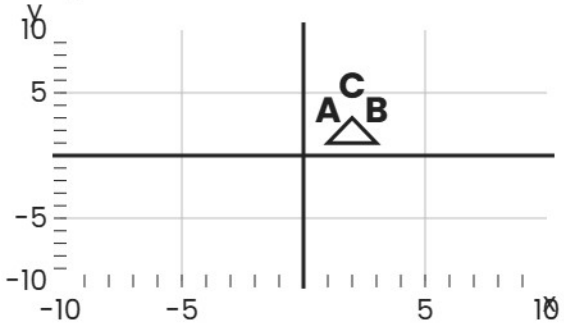
M8 Transformations, congruence, similarity

M8 8.G.A.1, 8.G.A.2, 8.G.A.3, 8.G.A.4

Name: _____ Date: _____

Translate, rotate, reflect, or dilate a figure on a coordinate grid and write the new coordinates. Name the sequence of moves that takes one figure to another. Tell whether two figures are congruent or similar and give the scale factor.

1 Dilate the triangle by a scale factor of 2 about the origin. Write the new coordinates of point C.



Point C ☐

---

2 Which sequence of moves takes figure 1 to figure 2?

Figure 1

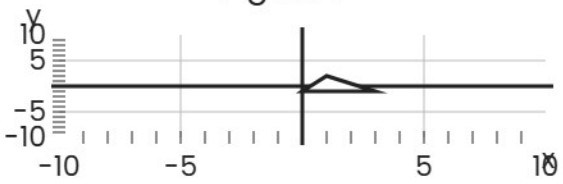


Figure 2



A. Translate 3 right, then reflect over the x-axis
B. Reflect over the x-axis, then rotate 180 degrees
C. Reflect over the y-axis, then translate 2 down

Answer Key

1. (4, 6)

2. Reflect over the y-axis, then translate 2 down

Math Practice - Grade 8

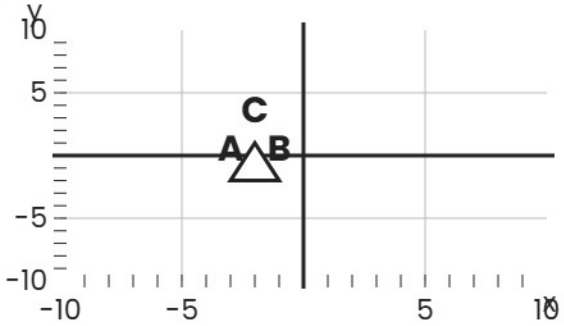
M8 Transformations, congruence, similarity

M8 8.G.A.1, 8.G.A.2, 8.G.A.3, 8.G.A.4

Name: _____ Date: _____

Translate, rotate, reflect, or dilate a figure on a coordinate grid and write the new coordinates. Name the sequence of moves that takes one figure to another. Tell whether two figures are congruent or similar and give the scale factor.

1 Translate the triangle 3 units left and 3 units down. Write the new coordinates of point A.



Point A ☐

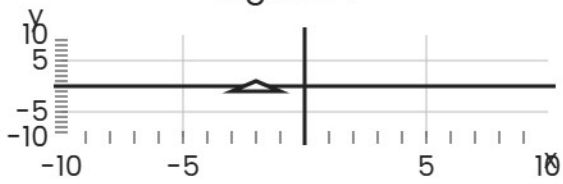
---

2 Which sequence of moves takes figure 1 to figure 2?

Figure 1



Figure 2



A. Reflect over the x-axis, then rotate 180 degrees
B. Translate 2 left, then reflect over the x-axis
C. Reflect over the y-axis, then translate 2 down

Answer Key

1. (-6, -5)

2. Reflect over the y-axis, then translate 2 down

Math Practice - Grade 8

M9 Angles, triangles, transversals

M9 8.G.A.5

Name: _____ Date: _____

Find the missing angles in a triangle. Find an exterior angle. Find angles formed by two parallel lines cut by a transversal. Tell whether two triangles are similar by angle angle.

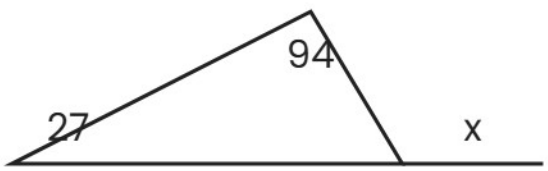
1 **Find the missing angle x in the triangle.**



x = ☐

---

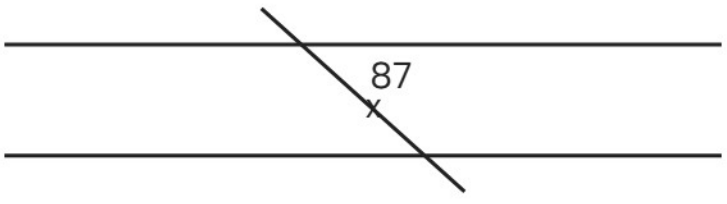
2 **Find the exterior angle x of the triangle.**



x = ☐

---

3 **Two parallel lines are cut by a transversal. One angle is 87 degrees. Find the alternate interior angle marked x.**



x = ☐

Answer Key

1. 35 2. 121 3. 87

Math Practice - Grade 8

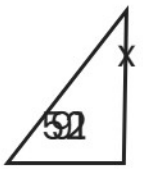
M9 Angles, triangles, transversals

M9 8.G.A.5

Name: _____ Date: _____

Find the missing angles in a triangle. Find an exterior angle. Find angles formed by two parallel lines cut by a transversal. Tell whether two triangles are similar by angle angle.

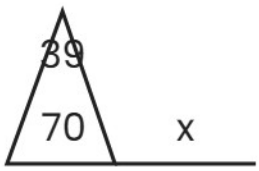
1 **Find the missing angle x in the triangle.**



x = ☐

---

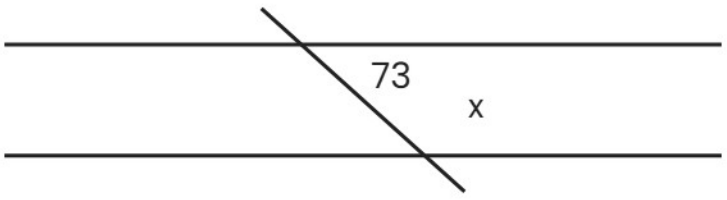
2 **Find the exterior angle x of the triangle.**



x = ☐

---

3 **Two parallel lines are cut by a transversal. One angle is 73 degrees. Find the same-side interior angle marked x.**



x = ☐

Answer Key

1. 37 2. 109 3. 107

Math Practice - Grade 8

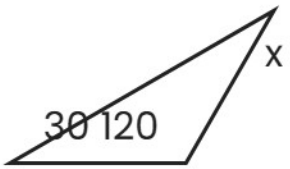
M9 Angles, triangles, transversals

M9 8.G.A.5

Name: _____ Date: _____

Find the missing angles in a triangle. Find an exterior angle. Find angles formed by two parallel lines cut by a transversal. Tell whether two triangles are similar by angle angle.

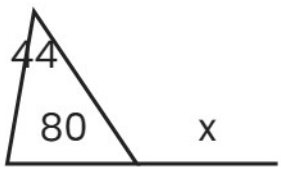
1 **Find the missing angle x in the triangle.**



x = ☐

---

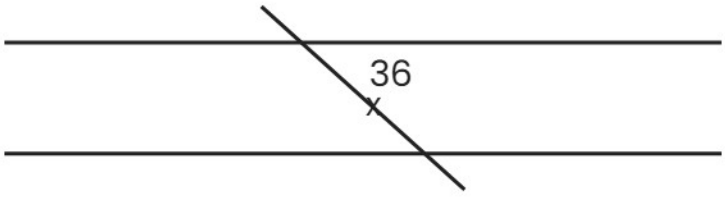
2 **Find the exterior angle x of the triangle.**



x = ☐

---

3 **Two parallel lines are cut by a transversal. One angle is 36 degrees. Find the alternate interior angle marked x.**



x = ☐

Answer Key

1. 30 2. 124 3. 36

Math Practice - Grade 8

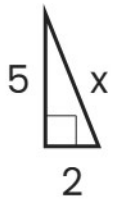
M10 Pythagorean theorem

M10 8.G.B.6, 8.G.B.7, 8.G.B.8

Name: _____ Date: _____

Find a missing side of a right triangle. Find the diagonal of a box. Find the distance between two points on a coordinate grid.

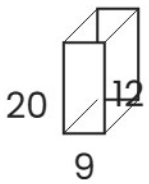
1 **Find the missing side x of the right triangle.**



x = ☐

---

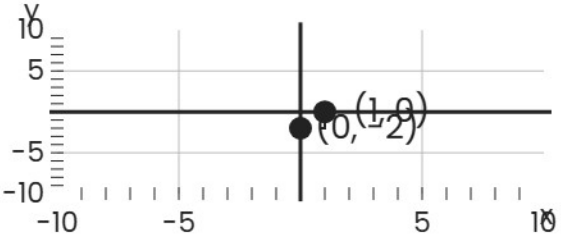
2 **A box is 9 by 12 by 20. What is the length of the diagonal of the box?**



Diagonal ☐

---

3 **Find the distance between (0, -2) and (1, 0).**



Distance ☐

Answer Key

1. $\sqrt{29}$ 2. 25 3. $\sqrt{5}$

Math Practice - Grade 8

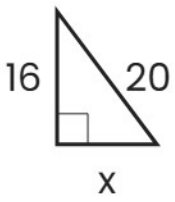
M10 Pythagorean theorem

M10 8.G.B.6, 8.G.B.7, 8.G.B.8

Name: _____ Date: _____

Find a missing side of a right triangle. Find the diagonal of a box. Find the distance between two points on a coordinate grid.

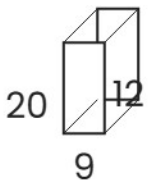
1 **Find the missing side x of the right triangle.**



x = ☐

---

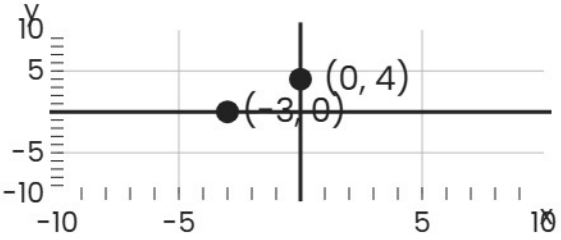
2 **A box is 9 by 12 by 20. What is the length of the diagonal of the box?**



Diagonal ☐

---

3 **Find the distance between (-3, 0) and (0, 4).**



Distance ☐

Answer Key

1. 12 2. 25 3. 5

Math Practice - Grade 8

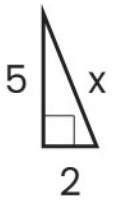
M10 Pythagorean theorem

M10 8.G.B.6, 8.G.B.7, 8.G.B.8

Name: _____ Date: _____

Find a missing side of a right triangle. Find the diagonal of a box. Find the distance between two points on a coordinate grid.

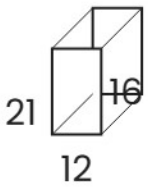
1 **Find the missing side x of the right triangle.**



x = ☐

---

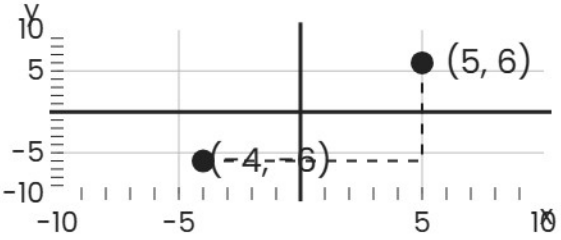
2 **A box is 12 by 16 by 21. What is the length of the diagonal of the box?**



Diagonal ☐

---

3 **Find the distance between (-4, -6) and (5, 6).**



Distance ☐

Answer Key

1. $\sqrt{29}$ 2. 29 3. 15

Math Practice - Grade 8

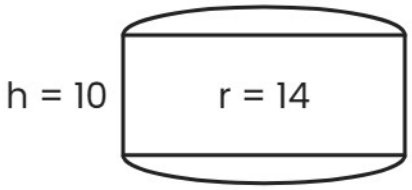
M11 Volume of cylinders, cones, spheres

M11 8.G.C.9

Name: _____ Date: _____

Find the volume of a cylinder, cone, or sphere from its radius and height. Find a missing dimension when the volume is given. Show that a cone is one third of a cylinder with the same base and height.

1 **Find the volume of the cylinder. Use pi = 22/7.**



Use pi = 22/7

Volume ☐

---

2 **The volume of the sphere is 904.32. Use pi = 3.14. Find the missing radius.**

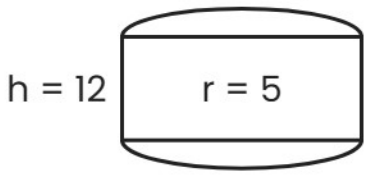


Use pi = 3.14

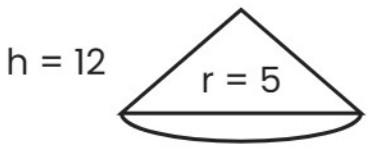
Radius ☐

---

3 **Use pi = 3.14. A cylinder holds 942 cubic units. A cone has the same base and height. How much does the cone hold?**



Cylinder



Cone

Cone volume ☐

Answer Key

1. 6160 2. 6 3. 314

Math Practice - Grade 8

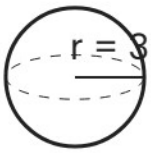
M11 Volume of cylinders, cones, spheres

M11 8.G.C.9

Name: _____ Date: _____

Find the volume of a cylinder, cone, or sphere from its radius and height. Find a missing dimension when the volume is given. Show that a cone is one third of a cylinder with the same base and height.

1 **Find the volume of the sphere. Use pi = 3.14.**

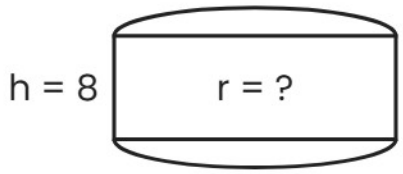


Use pi = 3.14

Volume ☐

---

2 **The volume of the cylinder is 401.92. Use pi = 3.14. Find the missing radius.**

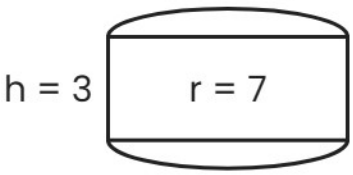


Use pi = 3.14

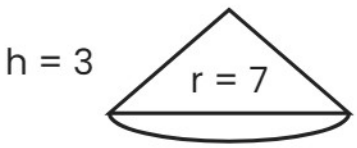
Radius ☐

---

3 **Use pi = 22/7. A cone holds 154 cubic units. A cylinder has the same base and height. How much does the cylinder hold?**



Cylinder



Cone

Cylinder volume ☐

Answer Key

1. 113.04 2. 4 3. 462

Math Practice - Grade 8

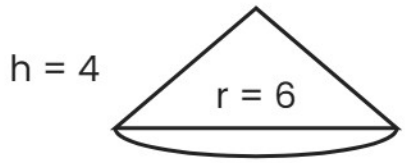
M11 Volume of cylinders, cones, spheres

M11 8.G.C.9

Name: _____ Date: _____

Find the volume of a cylinder, cone, or sphere from its radius and height. Find a missing dimension when the volume is given. Show that a cone is one third of a cylinder with the same base and height.

1 **Find the volume of the cone. Use pi = 3.14.**

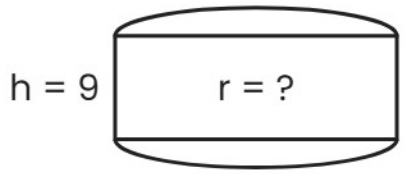


Use pi = 3.14

Volume ☐

---

2 **The volume of the cylinder is 113.04. Use pi = 3.14. Find the missing radius.**

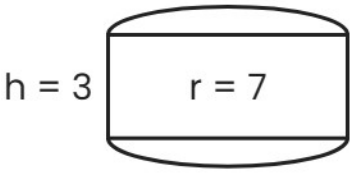


Use pi = 3.14

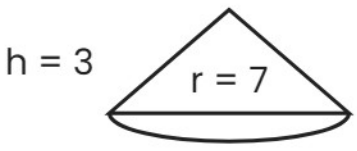
Radius ☐

---

3 **Use pi = 22/7. A cylinder holds 462 cubic units. A cone has the same base and height. How much does the cone hold?**



Cylinder



Cone

Cone volume ☐

Answer Key

1. 150.72 2. 2 3. 154

Math Practice - Grade 8

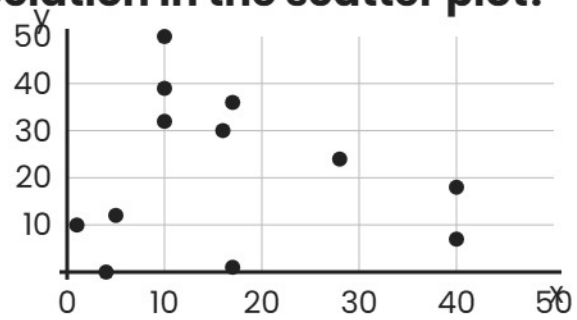
M12 Bivariate data

M12 8.SP.A.1, 8.SP.A.2, 8.SP.A.3, 8.SP.A.4

Name: _____ Date: _____

Tell whether the association in a scatter plot is positive, negative, or none, and whether it is linear or nonlinear. Pick the line that fits the data best. Use the equation of a fitted line to predict a value. Read a two way table with row and column totals.

1 What is the association in the scatter plot?

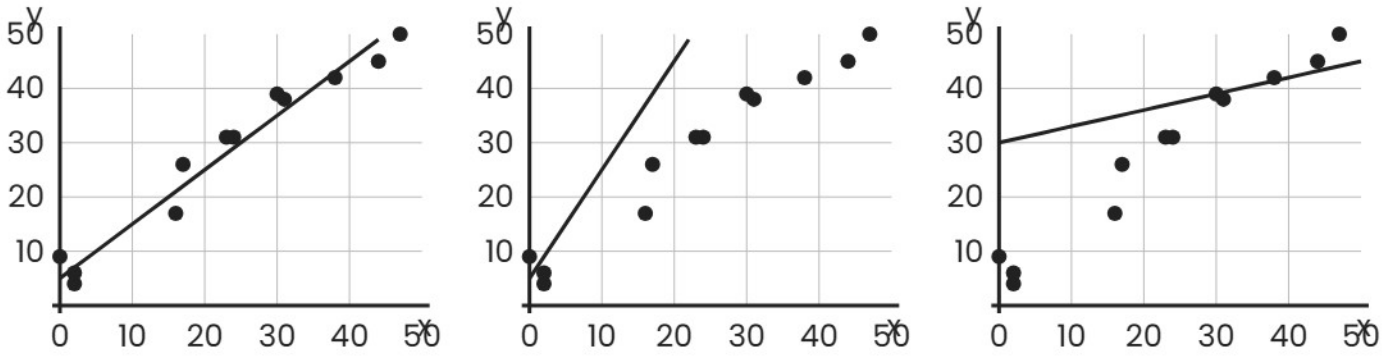


Positive linear	Negative linear	Positive nonlinear	Negative nonlinear

No association

---

2 Which line fits the data best?



A **B** **C**

Answer Key

1. No association 2. Line A

Math Practice - Grade 8

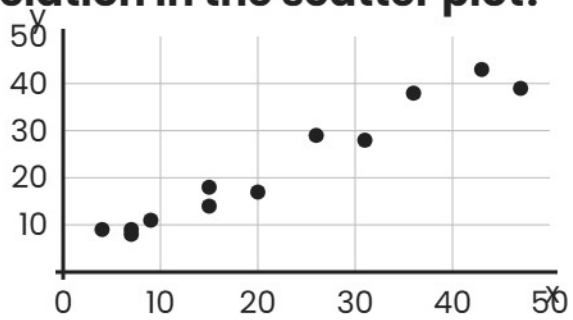
M12 Bivariate data

M12 8.SP.A.1, 8.SP.A.2, 8.SP.A.3, 8.SP.A.4

Name: _____ Date: _____

Tell whether the association in a scatter plot is positive, negative, or none, and whether it is linear or nonlinear. Pick the line that fits the data best. Use the equation of a fitted line to predict a value. Read a two way table with row and column totals.

1 What is the association in the scatter plot?

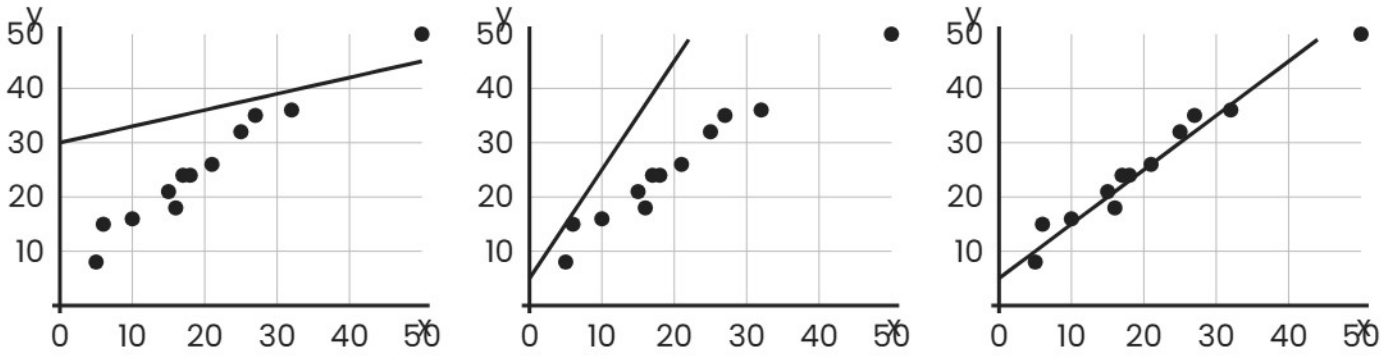


Positive linear	Negative linear	Positive nonlinear	Negative nonlinear

No association

---

2 Which line fits the data best?



A **B** **C**

Answer Key

1. Positive linear 2. Line C

Math Practice - Grade 8

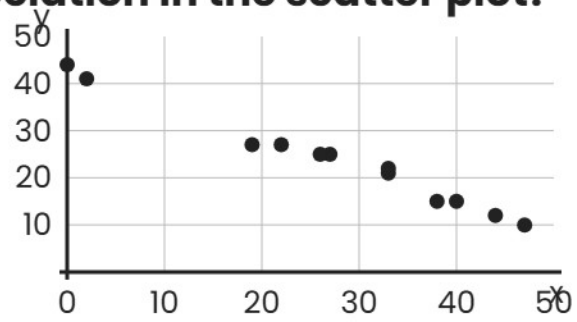
M12 Bivariate data

M12 8.SP.A.1, 8.SP.A.2, 8.SP.A.3, 8.SP.A.4

Name: _____ Date: _____

Tell whether the association in a scatter plot is positive, negative, or none, and whether it is linear or nonlinear. Pick the line that fits the data best. Use the equation of a fitted line to predict a value. Read a two way table with row and column totals.

1 What is the association in the scatter plot?

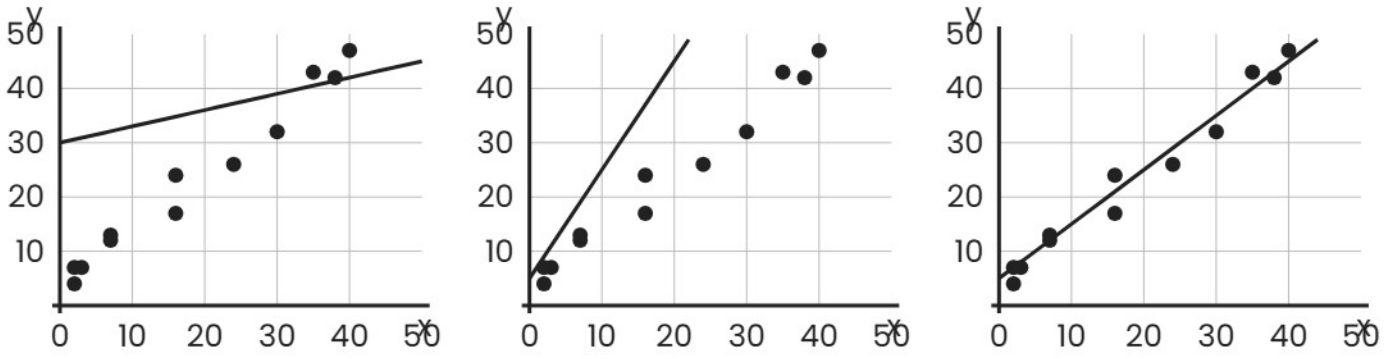


Positive linear	Negative linear	Positive nonlinear	Negative nonlinear

No association

---

2 Which line fits the data best?



A **B** **C**

Answer Key

1. Negative linear 2. Line C