1. Simplify.

$$\frac{-4(5+2^3)}{3}$$

a. $\frac{-44}{3}$ b. $\frac{52}{3}$ c. $\frac{-52}{3}$ d. $\frac{44}{3}$

2. Simplify.

$$2(4^3 - 24 \div 4)$$

a. 12
b. 20
c. 116
d. 140

3. Between which two consecutive whole numbers is $\sqrt{150}$?

a. 10 and 11
b. 11 and 12
c. 12 and 13
d. 13 and 14

4. Maya went to the store and bought two bags of chips for $1.59 each and a coke for $1.99. She paid with a $10 bill. What was her **change?**

a. $4.83
b. $5.09
c. $5.17
d. $5.83

5. Which expression is **NOT** equivalent to $-7-(-10)$?

a. $-7+10$
b. $10+7$
c. $-7+10$
d. $10+(-7)$

6. The regular price of an iPad Mini is $210. It is on sale for 22% off the regular price. If a 6% sales tax is added, what will be the **total** cost paid at the register?

a. $153.97

b. $163.80

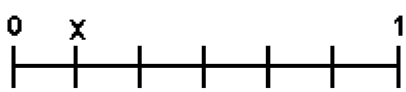
c. $173.63

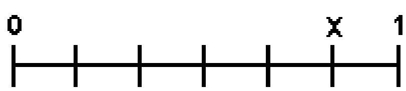
d. $176.40

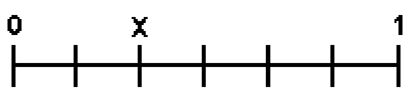
7. 54 is what percent of 90?

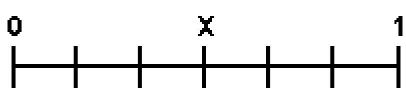
a. 1.60%
b. 0.60%
c. 60%
d. 160%

8. On which number line is $\left|-\frac{1}{3}\right|$ marked by the X?

a.


b.


c.


d.


9. How much **interest** will be earned after 6 months on a savings account containing $250 earning 7% interest annually? Use $I = prt$.

a. $105

b. $8.75

c. $10.50

d. $87.50

10. Which set of numbers are **all rational** numbers?

a. $-1.5, \ \pi, \ \frac{3}{4}$

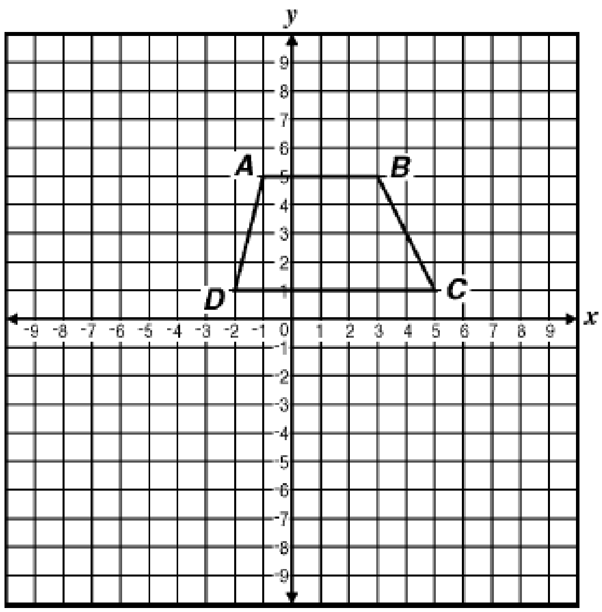
b. $\sqrt{10}, \ -3, \ |2.5|$

c. $0.\overline{6}, \ |7|, \ -7$

d. $3, \ \frac{1}{2}, \ \sqrt{2}$

11. Trapezoid *ABCD* below is to be translated to trapezoid A'B'C'D' by the following motion rule.

$$(x, y) \rightarrow (x+3, y-4)$$



What will be the coordinates of vertex C'?

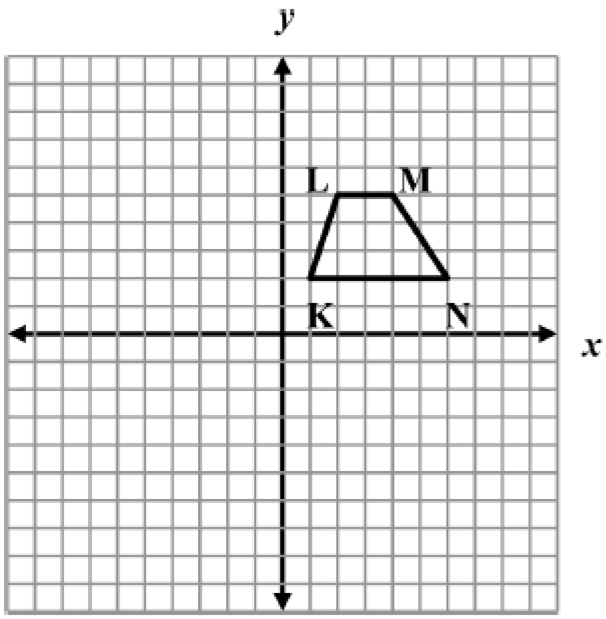
a. $(1, -3)$

b. $(2, 1)$

c. $(6, 1)$

d. $(8, -3)$

12. If trapezoid $KLMN$ shown below is reflected across the x-axis to form trapezoid $K'L'M'N'$, what are the apparent coordinates of M'?



a. $(-4, 5)$

b. $(-4, -5)$

c. $(4, -5)$

d. $(4, 5)$

13. A tree casts a shadow 9 yards long at the same time that a building 54 yards tall casts an 18-yard shadow. How **tall is the tree**? (Hint: Draw a diagram.)

a. 25 yd.

b. 30 yd.

c. 28 yd.

d. 27 yd.

14. A ladder is leaning against a house. The top of the ladder is 15 feet from the ground, and the base of the ladder is 12 feet from the side of the house. How **long** is the ladder? Round to the nearest integer.

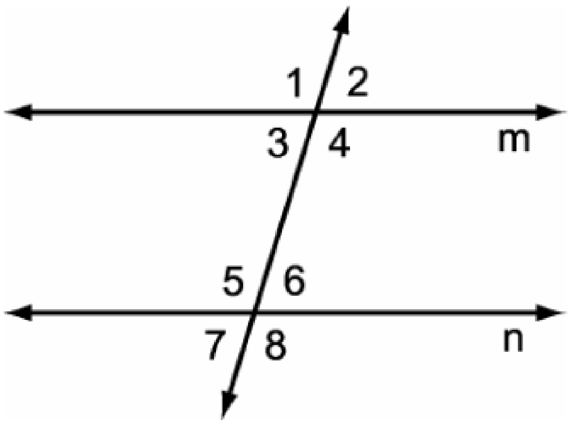
a. 369 feet

b. 27 feet

c. 19 feet

d. 9 feet

15. In the figure below, lines m and n are parallel. If m $\angle 1 = 100°$, then find m$\angle 5$.



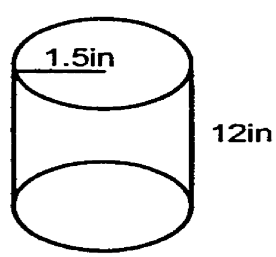
a. 80°
b. 100°
c. 110°
d. 140°

16. A rectangular swimming pool is 15 feet long, 10 feet wide, and filled to a level of 5 feet. How much **water** is in the pool?

a. 750 ft^3
b. 30 ft^3
c. 150 ft^3
d. 50 ft^3

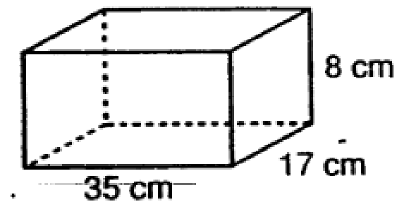
17. A can of tennis balls has a height of 12 inches and a radius of 1.5 inches. What is the volume of the can? Round to the nearest hundredth.

a. 266.21 in^3
b. 84.78 ft^3
c. 56.52
d. 113.04 ft^3



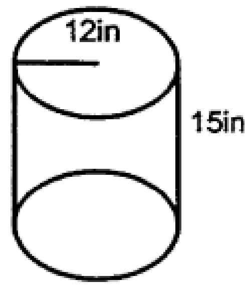
18. Find the surface area of the rectangular prism at the right.

a. 2,022 cm^2
b. 1,011 cm^2
c. 4,760 cm^2
d. none of these



19. Find the **surface area** of a cylinder whose height is 15 inches and whose radius is 12 inches. Use $S.A. = 2\pi r^2 + 2\pi rh$ and use **3.14 for** π. Round to the nearest hundredth. Round to the nearest tenth.

a. 565.2 in^2
b. 2,034.7 in^2
c. 6,782.4 in^2
d. 5,792.2 in^2



20. Eastview Junior High students order sweatshirts and T-shirts in either purple or gold. Of the students who ordered a sweatshirt, the relative frequency of ordering a gold one is half of the relative frequency of ordering a purple one. Which two-way table could show the data from the orders?

a.

Sweatshirt and T-Shirt Orders

	Sweatshirt	T-Shirt
Purple	12	18
Gold	24	15

b.

Sweatshirt and T-Shirt Orders

	Sweatshirt	T-Shirt
Purple	28	26
Gold	22	44

c.

Sweatshirt and T-Shirt Orders

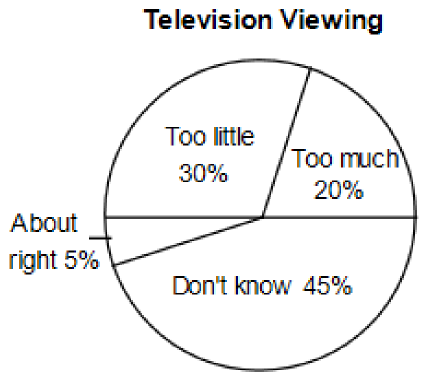
	Sweatshirt	T-Shirt
Purple	70	17
Gold	35	93

d.

Sweatshirt and T-Shirt Orders

	Sweatshirt	T-Shirt
Purple	45	50
Gold	25	25

21. Students were asked whether they spend too much or too little time watching television. The circle graph shows the responses of 120 students.
How many students thought they watched too little television?

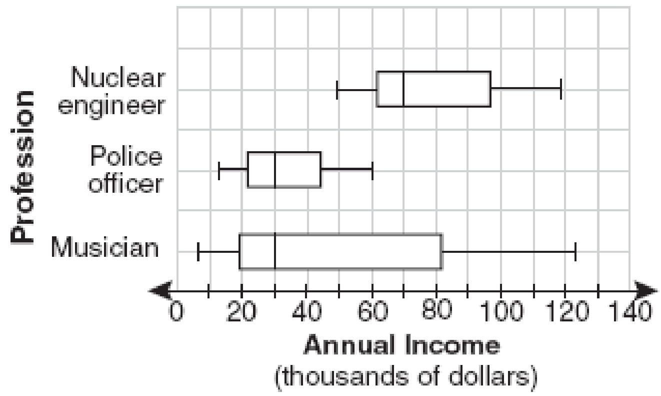


a. 84 students
b. 24 students
c. 6 students
d. 36 students

22. Which statement is **true** about two sets of data whose scatterplot shows a **positive** relationship?

a. One set of data increases as the other decreases.
b. Both sets of data increase.
c. The sets neither increase nor decrease.
d. None of these is true.

23. The accompanying box-and-whisker plots can be used to compare the annual incomes of three professions.



Based on the box-and-whisker plots, which statement is **true**?

a. The median income for nuclear engineers is greater than the income of all musicians.

b. The median income for police officers and musicians is the same.

c. All nuclear engineers earn more than all police officers.

d. A musician will eventually earn more than a police officer.

24. Which of the following is **most affected** by an outlier?

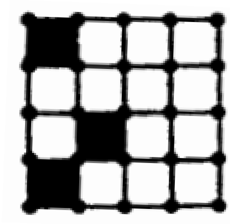
a. Mean

b. Median

c. Mode

d. None of these

25. If a dart is thrown randomly, what is the **probability** it will land in the **shaded** region?



a. $\frac{3}{13}$

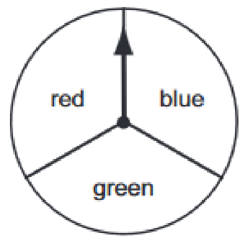
b. $\frac{3}{16}$

c. $\frac{1}{5}$

d. $\frac{13}{16}$

26. Rodney is going to perform an experiment. He will do multiple trials of flipping a coin once and then spinning the spinner shown below once.

Rodney's Spinner



Rodney needs to create a model to represent his sample space of the experiment. In the model he will use the following abbreviations: H = heads, T = tails, R = red, B = blue, and G = green. Which model could Rodney use to **best** represent the sample space for his experiment?

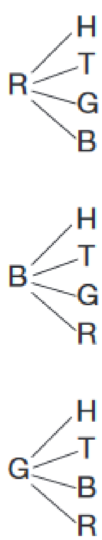
a.

HR	TR	RB
HB	TB	BG
HG	TG	GR

b.

HR	HB	HG
RH	BH	GH
TR	TB	TG
RT	BT	GT

c.



d.

27.

Find the slope of the line that contains $(-2, -2)$ and $(-10, -9)$.

a. $\frac{8}{7}$

b. $\frac{11}{12}$

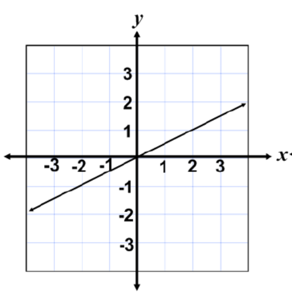
c. $\frac{12}{11}$

d. $\frac{7}{8}$

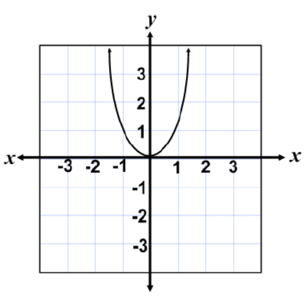
28.

Which graph represents a **proportional** relationship?

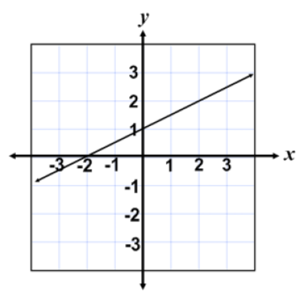
a.



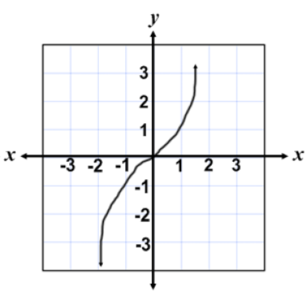
b.



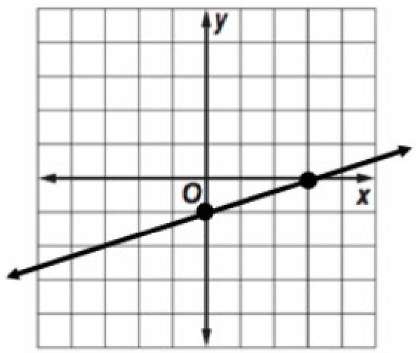
c.



d.



29.



What is the equation of the line?

a. $y = -\frac{1}{3}x + 1$

b. $y = -\frac{1}{3}x - 1$

c. $y = \frac{1}{3}x - 1$

d. $y = 3x - 1$

30.

Which is the solution to this pair of linear equations?

$$3x + y = 6$$
$$-x + 2y = 12$$

a. (0, 12)

b. (0, 6)

c. (0, −6)

d. (6, 0)

31.

Solve: $3n - 8 = 7$

a. 45

b. 5

c. -3

d. $-\frac{1}{3}$

32. **Solve the following equation:** $\mathbf{4x - 3 = 12 + x}$

a. $x = 45$
b. $x = 15$
c. $x = 5$
d. $x = 3$

33. Simplify: $(-3a)(7a^3)$

a. $-21a^4$
b. $-21a^3$
c. $-21a^2$
d. $-\left(\frac{21}{a^2}\right)$

34. $Evaluate\ the\ expression\colon\ \mathbf{3a - 2(b + 9)}, where\ a = 5\ and\ b = 6.$

a. -15
b. -10
c. 15
d. 30

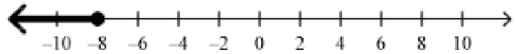
35. Which pair of terms are **like** terms?

a. $4x, 4$
b. x^2, x
c. $x^2, 2x$
d. $x^3, 5x^3$

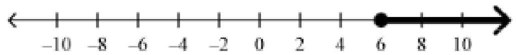
36. Which graph shows the solution of the inequality?

$$-\frac{x}{4} \leq 2$$

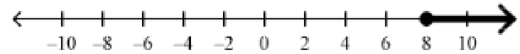
a. $x \leq -8$



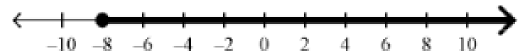
b. $x \leq 6$



c. $x \geq 8$



d. $x \geq -8$



37. Simplify by combining like terms:

$$3x^2 + 5x + 2 - x^2 + 2x - 6$$

a. $4x^2 + 7x + 8$

b. $3x^2 + 7x - x^2 - 4$

c. $2x^2 + 7x$

d. $2x^2 + 7x - 4$

38. Which equation shows the **relationship** between the variables in the table?

x	1	2	3	4
y	-4	-8	-12	-16

a. $y = x - 4$

b. $y = -4x$

c. $y = \frac{x}{-4}$

d. $y = x + 4$

39. **Find the function rule for the table shown.**

n	*?*
1	1
2	4
3	7
4	10
5	13

a. $n + 3$

b. $3n$

c. $3n - 2$

d. None of these

40. The table below shows information about the linear relationship between Ben's total savings and the number of months he saves money.

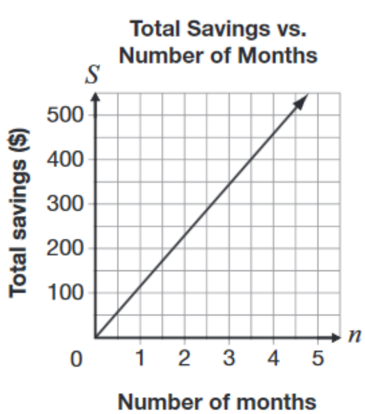
Number of months, n	Total savings, S ($)
3	345
6	540
9	735
12	930

Which of the following represents this relationship?

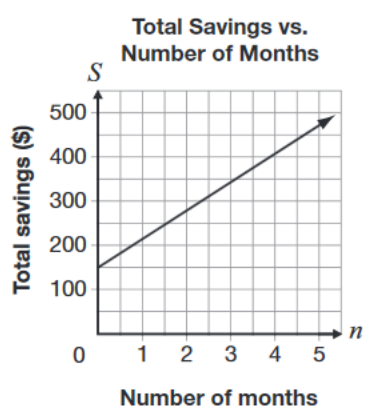
a $S = 65n + 345$

b $S = 195n + 150$

c



d



Assessment Matrix- Math-8 MST

Item #	Correct Choice	Common Core Standard	
1	C	CCSS.Math.Content.8.EE.A.1	Write and evaluate numerical expressions involving whole-number exponents.
2	C	CCSS.Math.Content.8.EE.A.1	Write and evaluate numerical expressions involving whole-number exponents.
3	C	CCSS.Math.Content.8.NS.A.2	Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2). *For example, by truncating the decimal expansion of √2, show that √2 is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations*.
4	A	CCSS.Math.Content.6.NS.B.3	Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
5	B	CCSS.Math.Content.7.NS.A.1.c	Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.
6	C	CCSS.Math.Content.7.RP.A.3	Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.
7	C	CCSS.Math.Content.7.RP.A.3	Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.
8	C	CCSS.Math.Content.7.NS.A.1.b	Understand $p + q$ as the number located a distance $\lvert q \rvert$ from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.
9	B	CCSS.Math.Content.7.RP.A.3	Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.
10	C	CCSS.Math.Content.8.NS.A.1	Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.
11	D	CCSS.Math.Content.8.G.A.3	Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
12	C	CCSS.Math.Content.8.G.A.3	Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.

13	D	CCSS.Math.Content.7.G.A.1	Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.
14	C	CCSS.Math.Content.8.G.B.7	Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.
15	B	CCSS.Math.Content.8.G.A.5	Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. *For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.*
16	A	CCSS.MATH.CONTENT.7.G.B.6	Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.
17	B	CCSS.Math.Content.8.G.C.9	Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.
18	A	CCSS.Math.Content.7.G.B.6	Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.
19	B	CCSS.Math.Content.7.G.B.4	Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.
		CCSS.Math.Content.7.G.B.6	Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.
20	C	CCSS.MATH.CONTENT.8.SP.A.4	Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. *For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?*

21	D	CCSS.Math.Content.6.RP.A.3.c	Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.
		CCSS.Math.Content.6.SP.B.4	Display numerical data in plots on a number line, including dot plots, histograms, and box plots.
22	B	CCSS.Math.Content.8.SP.A.1	Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.
23	B	CCSS.Math.Content.7.SP.B.3	Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. *For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable*.
24	A	CCSS.Math.Content.6.SP.B.5.c	Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.
25	B	CCSS.Math.Content.7.SP.C.5	Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.
26	D	CCSS.Math.Content.7.SP.C.8	Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.
27	D	CCSS.Math.Content.8.EE.B.6	Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b.
28	A	CCSS.Math.Content.7.RP.A.2.a	Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.
29	C	CCSS.Math.Content.8.F.A.3	Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. *For example, the function* $A = s^2$ *giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line*.

30	B	CCSS.Math.Content.8.EE.C.8.b	Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. *For example, 3x + 2y = 5 and 3x + 2y = 6 have no solution*
31	B	CCSS.Math.Content.8.EE.C.7	Solve linear equations in one variable.
32	C	CCSS.Math.Content.8.EE.C.7	Solve linear equations in one variable.
33	A	CCSS.Math.Content.8.EE.A.1	Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.
34	A	CCSS.Math.Content.6.EE.A.2.c	Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). *For example, use the formulas $V = s^3$ and $A = 6 s^2$ to find the volume and surface area of a cube with sides of length $s = 1/2$.*
35	D	CCSS.Math.Content.6.EE.A.4	Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). *For example, the expressions y + y + y and 3y are equivalent because they name the same number regardless of which number y stands for..*
36	D	CCSS.Math.Content.7.EE.B.4.b	Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where *p*, *q*, and *r* are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. *For example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions*.
37	D	CCSS.Math.Content.7.EE.A.1	Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.
38	B	CCSS.Math.Content.8.F.B.4	Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (*x, y*) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.
39	C	CCSS.Math.Content.8.F.A.1	Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input & corresponding output.[1]
40	D	CCSS.Math.Content.8.F.A.2	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.*