1 Which group of numbers is ordered from least to greatest?

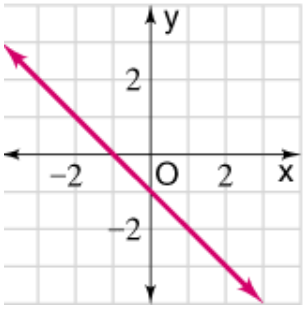
A $\frac{4}{5}$, –0.9, –3

B –3, –0.9, $\frac{4}{5}$

C –0.9, $\frac{4}{5}$, –3

D $\frac{4}{5}$, –3, –0.9

2 Which equation matches the graph shown?



A $x + y = 1$

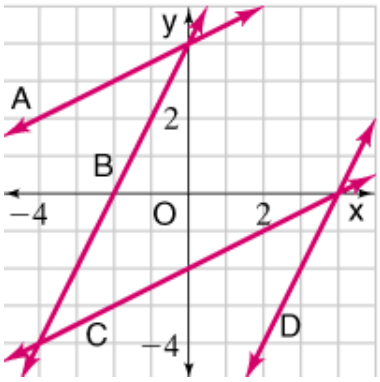
B $x - y = -1$

C $x + y = -1$

D $-x + y = -1$

3 Which line is the graph of the function rule?

$y = \frac{1}{2}x + 4$



A line *A*
B line *B*
C line *C*
D line *D*

4 Which expression simplifies to –1?

A $\frac{w+8}{w-8}$
B $\frac{x-6}{6-x}$
C $\frac{8-y}{8+y}$
D $\frac{z+9}{9-z}$

5 Solve.

$9x = 1$

A $\frac{1}{9}$
B 9
C -8
D 10

6 Simplify.
$4x(2 - 3x)$

A $5x$
B $-4x$
C $-4x^2$
D $8x - 12x^2$

7 Simplify.
$(3x^3 + 9x^2 - 2x) - (7x^3 - 6x^2 + 1)$

A $-4x^3 + 15x^2 - 3x$
B $-4x^3 + 3x^2 - 2x + 1$
C $-4x^3 + 15x^2 - 2x - 1$
D $-4x^3 + 15x^2 - 2x + 1$

8 Simplify.
$\sqrt{32x^2} \cdot \sqrt{2x^3}$

A $2x\sqrt{2\sqrt{x}}$
B $8x^2\sqrt{x^2}$
C $8x^2\sqrt{x}$
D $8x^3$

9 Simplify.
$3^2 + (9 - 8 \div 2)$

A $6\frac{1}{2}$
B $9\frac{1}{2}$
C 11
D 14

10 Simplify.
$5x^3y^4(6xy^{-1})^2$

A $30x^4y^2$
B $30x^4y^5$
C $30x^5y^2$
D $180x^5y^2$

11 Simplify.
$\frac{4x^5y^8}{12x^6y^5z^0}$

A 0
B $\frac{y^3}{3x}$
C $\frac{y^3z}{3x}$
D undefined

12 **Solve for *x*.**

$7x - 14 = 10$

A $\frac{4}{7}$
B $-\frac{4}{7}$
C $\frac{24}{7}$
D 12

13 **Solve for *x*.**

$\sqrt{3x+4} = \sqrt{7x+4}$

A 0
B 2
C identity
D no solution

14 **Solve for *x*.**

$|x - 5| = -8$

A –3
B –3 or 3
C –3 or 13
D no solution

15 **Solve for *x*.**

$2x^2 - 11x - 21 = 0$

A –3 or 7
B $3 \text{ or } \frac{7}{2}$
C $-7 \text{ or } \frac{3}{2}$
D $-\frac{3}{2} \text{ or } 7$

16 **Solve for *x*.**

$x - 4(x - 7) = 8x + 6$

A 2
B –2
C $-\frac{13}{11}$
D $-\frac{34}{11}$

17 **Solve for *x*.**

$9x = 7.2$

A 8
B 0.8
C –1.8
D 64.8

18 **Solve for *x*.**

$\frac{2x+1}{x+1} = \frac{7}{4}$

A 3
B 11
C $\frac{11}{15}$
D no solution

19 Choose the equation of a line in standard form that satisfies the given conditions.
perpendicular to $4x + y = 8$ through (4, 3)

A $x - 4y = -8$
B $x + 4y = 16$
C $4x - y = 11$
D $4x + y = 19$

20 **Evaluate.**

$f(x) = 7x - 10$ when $x = 2$

A –56
B 4
C 39
D 62

21 **Evaluate.**

$f(x) = 3^x + 4$ when $x = 2$

A 10
B 13
C 18
D 36

22 **Factor.**

$x^2 - 7x - 18$

A $(x - 3)(x - 6)$
B $(x + 2)(x - 9)$
C $(x - 2)(x + 9)$
D $(x - 3)(x - 4)$

23 **Factor.**

$x^3 + 3x^2 - 8x - 24$

A $x^3 + (3x + 4)(x - 4) - 8$
B $x^2(x + 3) - 8(x - 3)$
C $(x^2 - 8)(x + 3)$
D $(x^2 - 8)(x - 3)$

24 How many real number solutions exist for $2x^2 + 8x + 8 = 0$?

A 0
B 1
C 2
D 3

25 Find the 7th term in the sequence.
–10, –6, –2, 2, . . .

A 8
B 10
C 12
D 14

26 How many inches are in a mile?

A 15,840
B 1.57×10^{-5}
C 63,360
D 5292

27 Using the coordinates $A(-3, 4)$ and $B(-15, 8)$, approximate the length of segment AB to the nearest hundredth. Then find the coordinates of the midpoint of segment AB.

A 4; (–6, 2)
B 10.82; (–9, 6)
C 12.65; (–6, 2)
D 12.65; (–9, 6)

28 Find the product. Choose the correct answer given in standard form.
$(x^2 - 5)(x + 3)$

A $x^3 - 15$
B $x^2 - 2x - 15$
C $x^3 - 2x - 15$
D $x^3 + 3x^2 - 5x - 15$

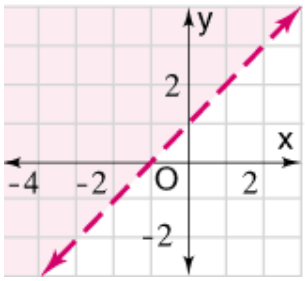
29 Suppose the function $y = 30{,}000(1.06)^x$ models the annual profit for a small business x years after 2000. Find the profit at the end of 2011.

A about $56,949
B about $222,600
C about $\$1.84 \times 10^{55}$
D about $\$3.29 \times 10^{31}$

30 What is 916,000 in scientific notation?

A 916×10^3
B 9.16×10^2
C 9.16×10^5
D 9.16×10^{-5}

31 Which inequality describes the graph?



A $y \leq x + 1$
B $y < x + 1$
C $y > x + 1$
D $y \geq x - 1$

32 **Solve the system of equations by any method.**

$11x + 8y = -16$
$x = 4y + 10$

A $(4, 7\frac{1}{2})$
B $(4, -1\frac{1}{2})$
C $(\frac{4}{9}, -2\frac{7}{8})$
D $(\frac{4}{13}, -2\frac{11}{26})$

33 At a garage sale, a CD costs three times as much as a book. You spend $28 to buy two books and four CDs. Choose a system of equations to find the price of a CD and the price of a book. Then solve.

A $c = 3b$
$28 = 2b + 4c$;
The CD costs $2 and a book costs $6.

B $3c = b$
$28 = 2b + 4c$;
The CD costs $2.80 and a book costs $8.40.

C $c = 3b$
$28 = 2b + 4c$;
The CD costs $6 and a book costs $2.

D $3c = b$
$28 = 2b + 4c$;
The CD costs $8.40 and a book costs $2.80.

34 22 is 88% of what number?

A 0.04
B 0.25
C 19.36
D 25

35 Julian plans to buy a car. The car costs $14,500. He lives in Kansas where the sales tax is 5.2%. What is the total cost of the car?

A $754
B $15,254
C $22,040
D $75,400

36 The students in a band are selling entertainment books. They earn $11.25 for each book they sell. Their goal is to earn more than $5,000. What is the fewest number of books they can sell and reach their goal?

A 444
B 445
C 444.44
D 56,250

37 Suppose the graph of the equation below is translated 3 units up. What is the equation of the new graph?

$y = \frac{2}{x}$

A $y = \frac{2}{x-3}$
B $y = \frac{2}{x+3}$
C $y = \frac{2}{x} - 3$
D $y = \frac{2}{x} + 3$

38 A local phone company charges a monthly fee of $34.99 plus $.05 for each minute of long distance calls. Parts of minutes are rounded up to the next whole minute. Find the minimum and maximum long-distance minutes for customers whose monthly bill is at least $53.24 but no more than $132.00.

A at least 2, no more than 3
B at least 365, no more than 1,940
C at least 365, no more than 1,941
D at least 1,065, no more than 2,640

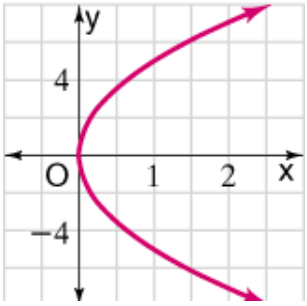
39 Which of these could be the sides of a right triangle?

A 8 cm, 16 cm, 20 cm
B 10 cm, 16 cm, 20 cm
C 11 cm, 16 cm, 20 cm
D 12 cm, 16 cm, 20 cm

40 What is true of the equation $y = 2x^2 - 5$?

A Its graph opens upward.
B The vertex of the graph is at the origin.
C Its graph opens downward.
D Its graph is wider than $y = x^2$.

41 Is this graph a function? Explain.



A Yes; you cannot draw a horizontal line that goes through more than one point of the graph.
B Yes; each y-value has a single corresponding x-value.
C No; some x-values do not have corresponding y-values.
D No; you can draw vertical lines that go through more than one point of the graph.

42 Which expression is equal to $(x^2 - 4y)^2$?

A $x^4 - 4y^2$
B $x^4 - 16y^2$
C $x^4 + 16y^2$
D $x^4 - 8x^2y + 16y^2$

43 Which is a step used to simplify $\frac{8}{\sqrt{5} + \sqrt{23}}$?

A Multiply $\frac{8}{\sqrt{5} + \sqrt{23}}$ by $\frac{\sqrt{5} + \sqrt{23}}{\sqrt{5} + \sqrt{23}}$ to get $\frac{8\left(\sqrt{5} + \sqrt{23}\right)}{5 + 23}$.
B Add $\sqrt{5} + \sqrt{23}$ to get $\sqrt{28}$.
C Multiply $\frac{8}{\sqrt{5} + \sqrt{23}}$ by $\frac{\sqrt{5} - \sqrt{23}}{\sqrt{5} - \sqrt{23}}$ to get $\frac{8\left(\sqrt{5} - \sqrt{23}\right)}{5 - 23}$.
D The expression cannot be simplified.

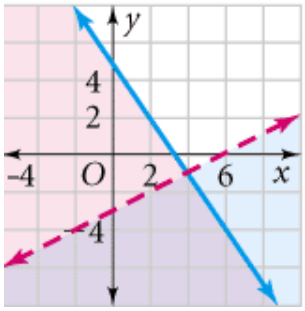
44 Find the vertex of the function $y = 2x^2 - 4x + 5$.

A (1, 3)
B (0, 5)
C (2, 5)
D (1, –3)

45 Choose the equation of the direct variation that includes the point (3, –9).

A $y = 3x$
B $y = -3x$
C $y = x + 6$
D $y = x - 12$

46 Which system of inequalities is shown in the graph?



A $y > \frac{1}{2}x - 3$
$y \geq -\frac{3}{2}x + 5$

B $y < \frac{1}{2}x - 3$
$y \geq -\frac{3}{2}x + 5$

C $y < \frac{1}{2}x - 3$
$y \leq -\frac{3}{2}x + 5$

D $y < \frac{1}{2}x - 3$
$y < -\frac{3}{2}x + 5$

47 Solve $PV = nRT$ for R.

A $R = PVnT$

B $R = \frac{PVT}{n}$

C $R = \frac{PVn}{T}$

D $R = \frac{PV}{nT}$

48 Solve the compound inequality $-1 < x + 2 \leq 7$.

A $1 < x \leq 9$

B $-1 < x \leq 5$

C $-3 < x \leq 5$

D $-3 < x \leq 7$

49 Last quarter, 200 students participated in the after-school tutoring program. This quarter, 184 students are participating in the after-school tutoring program. Find the percent of decrease from last quarter to this quarter.

A 8%
B 8.7%
C 16%
D 92%

50 When you roll a standard number cube once, what is the probability of rolling a number divisible by 3?

A 1
B $\frac{1}{2}$
C $\frac{1}{3}$
D $\frac{1}{6}$