ACT Practice 1 Name: ________________________

1. If x > 0, $y \geq 0$, each of the following MUST be a real number EXCEPT:

A. xy
B. $|xy|$
C. $\frac{y}{x}$
D. $\frac{x}{y}$
E. $\sqrt{xy}$

2. If x and y are rational, $x \neq 0$, $y \neq 0$, each of the following is a rational number EXCEPT:

F. x + y
G. xy
H. x – y
J. $\frac{x}{y}$
K. $\sqrt{xy}$

3. The product of two irrational numbers is always:

A. irrational
B. rational
C. positive
D. negative
E. none of the above

4. For the complex number *i* such that i^2 = -1, what is the value of $i^4 + 2i^2$?

A. – 2
B. – 1
C. 0
J. 1
K. 2

5. In the complex numbers, where $i^2 = -1$, $\frac{1}{1+i} \bullet \frac{1-i}{1-i} = ?$

A. i – 1
B. i + 1
C. 1 – i
D. $\frac{1-i}{2}$
E. $\frac{1+i}{2}$

6. What is the y-intercept of the line $3x-3y=5$?

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

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

C. $-\frac{5}{3}$

D. $-\frac{3}{5}$

E. 1

7. What is the slope of $\overline{AB}$?

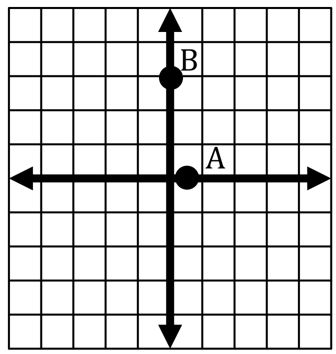
F. 0

G. 6

H. -6

J. $\frac{1}{6}$

K. $-\frac{1}{6}$



8. Which of the lines shown below has a negative slope?

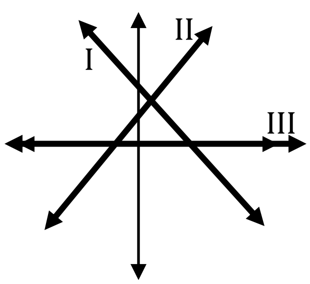
A. I only

B. II only

C. I & II only

D. II & III only

E. I, II, & III



9. Which of the following is the equation of the line below?

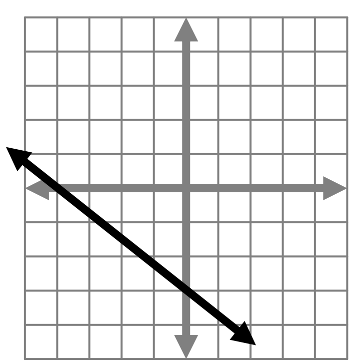
F. $y=\frac{4}{3}x-3$

G. $y=\frac{3}{4}x+3$

H. $y=-\frac{3}{4}x+3$

J. $y=\frac{3}{4}x-3$

K. $y=-\frac{3}{4}x-3$



ACT Practice 2 Name: ______________________

1. Which of the these points lies on the line $y = -2x + 5$?

   A. (2, 1)
   B. (2, - 1)
   C. (2, 9)
   D. (2, -9)
   E. (2, 10)

2. Which of these is parallel to the line $x - 2y = 4$ and passes through the point (-4, -1)?

   F. x – 2y = 2
   G. 2y – x = 2
   H. x – 2y = 7
   J. 2y – x = 7
   K. 2x – y = 4

3. Which of the following has a y-intercept of 2 and passes through the point (1, -3)?

   A. $y = \frac{2}{3}x + 2$
   B. $y = \frac{-2}{3}x + 2$
   C. y = 5x + 2
   D. y = - 5x + 2
   E. y = 6x + 2

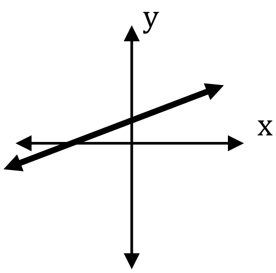
4. What is the equation of the line passing through (-1,3) with a slope of zero?
   A. x = 3
   B. y = 3
   C. x = 3y
   D. y = 3x
   E. y = 3x – 1

5. If the line, y = 2x – 1, is moved 2 units to the left, what is the equation of the new line?

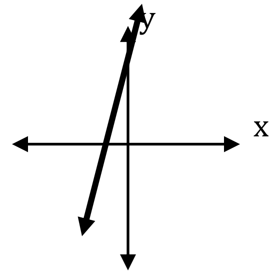
   F. y = 2x + 3
   G. y = 2x – 2
   H. y = 2x + 1
   J. y = 2x + 2
   K. y = 2x

6. Which of the following is the graph of y = -3x + 9?

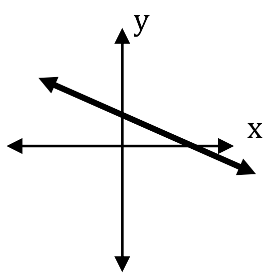
F.



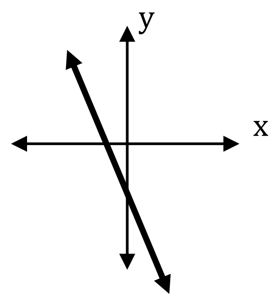
J.



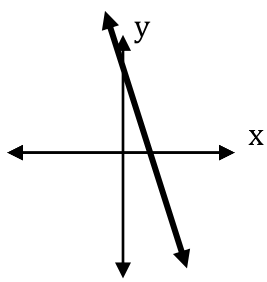
G.



K.



H.



7. If k is any real number, the equation, y = kx – 2, will represent all lines with:

A. a slope of – 2
B. a slope of 2
C. a y-intercept of – 2
D. a y-intercept of 2
E. all of the above

8. $(2\sqrt{12})(\sqrt{24}) =$?

A. $8\sqrt{6}$
B. $12\sqrt{2}$
C. $12\sqrt{3}$
D. $12\sqrt{6}$
E. $24\sqrt{2}$

ACT Practice 3 Name: ______________________

1. $3^4 3^{-9}$ =?

   F. 3^5
   G. 3^{13}
   H. 3^{-5}
   J. 3^{-13}
   K. 3^{-36}

2. $\sqrt{2+6 \bullet 8}$ =?

   A. $2\sqrt{5}$
   B. $5\sqrt{2}$
   C. $2\sqrt{15}$
   D. $4\sqrt{15}$
   E. $15\sqrt{2}$

3. If $x = 2\sqrt{2}$, $2x^2 - 3x + 2 = ?$

   F. $18 - 6\sqrt{2}$
   G. $30 - 6\sqrt{2}$
   H. $34 - 6\sqrt{2}$
   J. $62 - 6\sqrt{2}$
   K. $66 - 6\sqrt{2}$

4. $\left(\sqrt{2} + 2\sqrt{5}\right)\left(2\sqrt{2} - 3\sqrt{5}\right) =$

   A. -142
   B. -26
   C. $-142 + \sqrt{10}$
   D. $-26 + \sqrt{10}$
   E. 0

5. $3\sqrt{20} + 2\sqrt{45} =$

   F. $5\sqrt{65}$
   G. $2\sqrt{5}$
   H. $6\sqrt{5}$
   J. $12\sqrt{5}$
   K. $12\sqrt{10}$

6. $\sqrt{7+\sqrt{x}} = 2+\sqrt{3}$

A. 48
B. 32
C. 24
D. 16
E. 12

7. $\left(3\sqrt{3}-2\sqrt{5}\right)\left(3\sqrt{3}+2\sqrt{5}\right) =$

F. 7
G. 47
H. $7+12\sqrt{15}$
J. $47+12\sqrt{15}$
K. $7-12\sqrt{15}$

8. If $a \neq 0$, $\dfrac{a^{\frac{1}{2}}}{a^{\frac{1}{3}}} =$

A. $a^{\frac{3}{2}}$
B. $a^{\frac{1}{6}}$
C. $a^{\frac{2}{3}}$
D. $a^{\frac{5}{6}}$
E. a^{6}

9. $16^{\frac{-3}{4}} + 8^{\frac{2}{3}} =$

F. 32
G. 12
H. $4\frac{1}{8}$
J. 4
K. $-6\frac{2}{3}$

ACT Practice 4 Name: ________________________

1. For $x > 0, y > 0$ then $\dfrac{\sqrt{x}-\sqrt{y}}{\sqrt{x}+\sqrt{y}} =$

   A. $\dfrac{x+y}{x-y}$

   B. $\dfrac{x-y}{x+y}$

   C. -1

   D. $\dfrac{x-2\sqrt{xy}+y}{x-y}$

   E. $\dfrac{x+2\sqrt{xy}+y}{x+y}$

2. There are 8 blocks in a box. Each one has a different number on it from 1 to 8. If two blocks are drawn from the box, which of the following CANNOT be the sum?

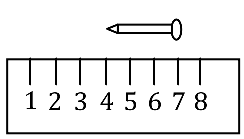
   A. 2
   B. 5
   C. 10
   D. 12
   E. 15

3. To have flyers printed, costs \$50 for the first 100 and \$10 for each additional 100. How many can be printed for \$100?

   F. 500
   G. 600
   H. 700
   J. 800
   K. 900

4. If the ruler below is marked in inches, what is the length of the nail to the nearest inch?

   A. 7
   B. 6
   C. 5
   D. 4
   E. 3



5. Two buildings appear to be the same height. One is 50 feet tall. If the other is 5 times as far away, how tall is it?

F. 10 feet
G. 50 feet
H. 100 feet
J. 250 feet
K. 2500 feet

6. If a car gets 33 miles per gallon of gasoline and gasoline costs $1.08 per gallon, what would it cost to go 300 miles?

A. $8.73
B. $9.82
C. $11.21
D. $35.64
E. $106.92

7. Which of the following is equivalent to 15.5×10^{-4}?

F. .0000155
G. .000155
H. .00155
J. 155,000
K. 1,550,000

8. Points X, Y, and Z, are on the same line in that order. If the distance from X to Z is 8.32×10^{6} and the distance from Y to Z is 25.3×10^{3}, how far is it from X to Y?

A. 5,790,000
B. 8,067,000
C. 8,294,700
D. 8,345,300
E. 8,573,000

9. The sun is about 150,000,000 km away. Light travels about 300,000 km per second. About how many seconds does it take for sunlight to reach earth?

F. 5.0×10^{-1}
G. 5.0×10^{0}
H. 5.0×10^{1}
J. 5.0×10^{2}
K. 5.0×10^{3}

ACT Practice 5 Name: ______________________

1. What is the total cost of 3.5 pounds of peaches at 86 cents per pound and 4.5 pounds of pears at 68 cents per pound?

A. $3.01
B. $3.06
C. $6.01
D. $6.07
E. $7.60

2. Bob is buying a car for $ 6300. He gets a trade-in allowance of $1250 for his old car, but has to pay $ 480 for sales tax and license. How much does he need to borrow to cover the balance?

F. $4570
G. $5530
H. $6830
J. $7070
K. $8030

3. $\dfrac{(7.5\times10^{6})(2\times10^{2})}{(3\times10^{4})(2.5\times10^{9})}$

A. 3.5×10^{-4}
B. 3.0×10^{5}
C. 2.0×10^{-4}
D. 2.0×10^{-5}
E. 2.0×10^{5}

4. If $x\neq0, z\neq0$, simplify $\dfrac{32x^5y^4z^8}{-16x^3z^2}$.

A. $16x^2y^4z^6$
B. $16x^2y^4z^4$
C. $2x^2y^4z^6$
D. $-2x^2y^4z^4$
E. $-2x^2y^4z^6$

5. For which nonnegative value of x is $\dfrac{1}{9-x^2}$ undefined?

F. 61
G. 18
H. 9
J. 3
K. 0

6. $\frac{2x}{x^2-2x-3}$ is defined except for which 2 values of x?

A. -2 and -3
B. -1 and 3
C. 0 and -2
D. 0 and 2
E. 1 and -3

7. Which is simplified form of $\frac{4}{x}+\frac{6x+2}{x^2}$

F. $\frac{6(x+1)}{x}$
G. $\frac{6(x+1)}{x^2}$
H. $\frac{6x+6}{x^3}$
J. $\frac{10x+2}{x^2}$
K. $\frac{12}{x}$

8. Which is a simplified version equivalent to $\frac{3+6x}{9x}$?

A. $\frac{2x+1}{3x}$
B. $\frac{1+6x}{3x}$
C. 1
D. 2
E. $\frac{7}{3}$

9. For all x in its domain, $\frac{x+1}{x^3-x}$ is equivalent to:

F. $\frac{1}{x^2}-\frac{1}{x^3}$
G. $\frac{1}{x^3}-\frac{1}{x}$
H. $\frac{1}{x^2-1}$
J. $\frac{1}{x^2-x}$
K. $\frac{1}{x^3}$

ACT Practice 6 Name: ___________________________

1. For all positive integers x, y, and z, $\frac{x}{y}$ is equivalent to:

A. $\frac{xz}{yz}$

B. $\frac{xx}{yy}$

C. $\frac{yx}{xy}$

D. $\frac{x-z}{y-z}$

E. $\frac{x+z}{y+z}$

2. For all $x > 3$, $\frac{3x - x^2}{x^2 + 3x - 18} =$

A. $\frac{-x}{x+6}$

B. $\frac{x}{x-6}$

C. $\frac{1}{x+6}$

D. $-\frac{1}{18}$

E. $\frac{1}{18}$

3. For all nonzero r, t, and z values, $\frac{16r^3tz^5}{-4rt^3z^2}$

F. $-\frac{4z^3}{r^2t^2}$

G. $-\frac{4r^2z^3}{t^2}$

H. $-\frac{4rz}{t}$

J. $-4r^4t^4z^7$

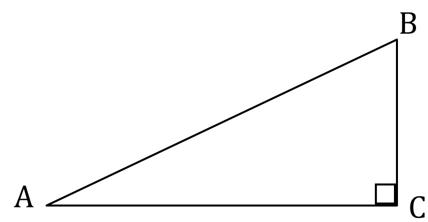
K. $-4r^2t^2z^3$

4. For all nonzero a and b, $\dfrac{(10a^2b^2)(-9a^2b^3)}{6a^2b^4} =$

A. $-15b$
B. $-15a^2b$
C. $-15a^2b^2$
D. $\dfrac{a^2b^2}{15}$
E. $\dfrac{12}{15}$

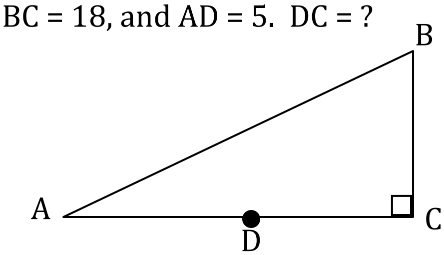
5. ABC is a right triangle. If BC = 9 and AB = 12, then AC = ?

A. $9\sqrt{7}$
B. $3\sqrt{7}$
C. 15
D. 63
E. 225



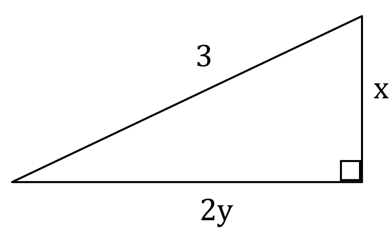
6. ABC is a right triangle. AB = 30, BC = 18, and AD = 5. DC = ?

F. 19
G. 20
H. 21
J. 24
K. 29



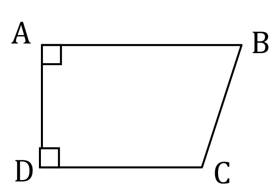
7. In the right triangle below, find the length of x in terms of y.

A. 3 + 2y
B. 3 – 2y
C. 2y – 3
D. $\sqrt{9+4y^2}$
E. $\sqrt{9-4y^2}$



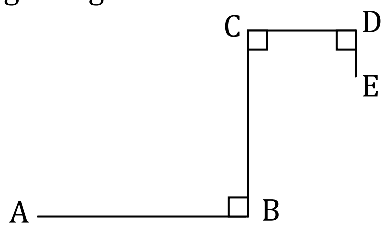
8. In trapezoid ABCD below, $m\angle A = m\angle D = 90°$. If BC = 26, DC = 36, AB = 46, then AD = ?

F. $2\sqrt{194}$
G. $4\sqrt{194}$
H. 22
J. 23
K. 24



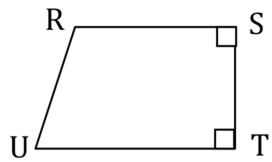
ACT Practice 7 Name: ___________________________

1. In the figure below, the angles are all right angles as marked. AB = 24, BC = 19, CD = 12, and DE = 4. AE = ?



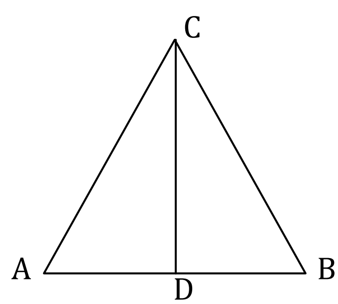
A. 31
B. 33
C. 37
D. 39
E. 41

2. In trapezoid RSTU, RS = 18, RU = 12, $m\angle S = m\angle T = 90°$, and $m\angle U = 60°$. What is the perimeter of the trapezoid?



F. 6
G. $6\sqrt{3}$
H. 54
J. $54 + 6\sqrt{3}$
K. $54 + 12\sqrt{3}$

3. ΔABC is equilateral. If altitude CD = 9, then AC = ?

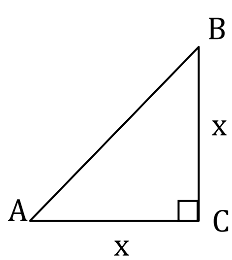


A. $6\sqrt{3}$
B. $3\sqrt{3}$
C. $\sqrt{3}$
D. 9
E. 4.5

4. A 16-foot ladder is leaning against a house. The top of the ladder is about 15 feet above the ground. The base of the ladder is about how far from the house?

F. 4 feet 8 inches
G. 5 feet 2 inches
H. 5 feet 7 inches
J. 6 feet 3 inches
K. 6 feet 9 inches

5. Below is an isosceles right triangle. If AB=8, x=?



A. 8
B. 4
C. $4\sqrt{2}$
D. $2\sqrt{2}$
E. $8\sqrt{2}$

6. Evaluate $2x^2 - 2x - 5$ when x = -3.

A. 7
B. 18
C. 19
D. 25
E. 37

7. If a = -1 and b = 2, then $2a^3 + 3a^2b - ab^2 - 3b = ?$

F. 0
G. -10
H. -12
J. 12
K. 2

8. Find the value of $2 - \left(2a^2 + 3ab\right)$ when a = -2 and b = 1?

A. -20
B. -12
C. -8
D. 4
E. 0

9. For all x, x(2x – 3) – 2(5 – x) = ?

F. $2x^2 - 5x - 10$
G. $2x^2 - x - 10$
H. $2x^2 + x - 13$
J. $2x^2 - x - 13$
K. $2x^2 - 5x - 13$

10. For all x and all N, $\left(4x^2 + 3\right) - \left(x^2 + Nx - 3\right) = ?$

A. $3x^2 + Nx$
B. $3x^2 - Nx$
C. $3x^2 - Nx + 6$
D. $3x^2 + Nx + 6$
E. $3x^2 - Nx - 6$

ACT Practice 8 Name: ___________________________

1. For all x<0, y> 0, (2x +y)(3x) - 4xy =?

F. $6x^2 - xy$
G. $6x^2 - 7xy$
H. $6x^2 + 7xy$
J. $6x^2 + 3y^2 - 4xy$
K. $6x^2 + 3xy^2 - 4xy$

2. For variables a and b, $x = 2a^2$, $y = -2a^2 - 3b$. Which of the following represents the product of xy?

A. $4a^4 - 6a^2b$
B. $-4a^4 - 6a^2b$
C. $-4a^4 + 6a^2b$
D. $-2a^4 - 6a^2b$
E. $-2a2 - 6a^2b$

3. Which of the following is a factor of $3x^2 + x - 24$?

F. x – 3
G. x – 6
H. 3x – 6
J. 3x – 8
K. 3x – 2

4. If x>0, $y \leq 0$, $y^2 - x^2$?

A. (x – y)(x + y)
B. (y – x)(y + x)
C. (x – y)(x – y)
D. (y – x)(y – x)
E. y – x

5. What is the greatest common factor of $12x^3y$ and $8x^2y^2$?

F. $2x^2$
G. $4x^2$
H. $4x^2y$
J. $4x^2y^2$
K. $4x^3y^2$

6. Which is the complete factorization of $6x^3y^2 + 15x^2y^2 - 36xy^2$

A. $3xy^2\left(2x^2 + 5x - 12\right)$
B. $3xy^2\left(2x^2 - 5x + 12\right)$
C. $3xy^2\left(2x - 4\right)\left(x + 3\right)$
D. $3xy^2\left(2x + 4\right)\left(x - 3\right)$
E. $3xy^2\left(2x - 3\right)\left(x + 4\right)$

7. For all x, $\left(x - 3\right)^2 + \left(x + 1\right)^2 =$

F. $2x^2 + 10$
G. $2x^2 - 10$
J. $2x^2 + 2x + 10$
K. $2x^2 - 2x + 10$
L. $2x^2 - 4x + 10$

8. If $x \neq 0, z \neq 0,$ simplify $\dfrac{32x^5y^4z^8}{-16x^3z^2}$

A. $16x^2y^4z^6$
B. $-16x^2y^4z^4$
C. $2x^2y^4z^6$
D. $-2x^2y^4z^4$
E. $-2x^2y^4z^6$

9. A rectangle has a length of (4x – 1) and a width of (x + 5). What is the area?

F. 5x + 4
G. 10x + 8
H. $4x^2 - 5$
J. $4x^2 + 19x - 5$
K. $4x^2 + 21x - 5$