COWLEY COUNTY COMMUNITY COLLEGE
REVIEW GUIDE
Compass Algebra – Level 2

This study guide is for students trying to test into College Algebra. There are three levels of math study guides.

1. If $x = 2$ and $y = -1$, what is the value of the expression $2y^3 + 3xy^2$?
   A. 8
   B. 4
   C. 10
   D. 6
   E. 5

2. Which of the following expressions represents the product of four less than three times x and two more than x?
   A. $3x^2 - 2x - 8$
   B. $3x^2 - 2x + 8$
   C. $3x^2 + 2x + 8$
   D. $3x^2 + 2x - 8$
   E. $3x^2 + 10x - 8$

3. A student earned scores of 92, 89, and 79 on three of four exams. What must the student score on the fourth exam to have an average (arithmetic mean) of exactly 85?
   A. 80
   B. 82
   C. 84
   D. 86
   E. 87

4. What is the equation of the line that contains the points (3, 5) and (6, –2)?
   A. $y = -\frac{7}{3}x - 6$
   B. $y = -\frac{7}{3}x + 12$
   C. $y = -\frac{3}{7}x + 5$
   D. $y = -\frac{3}{4}x - 7$
   E. $y = -\frac{3}{4}x - \frac{7}{3}$

5. For all $x \neq \pm 6$, $\dfrac{x^2 - x - 42}{x^2 - 36} =$

   A. $\dfrac{x-7}{x+6}$

   B. $\dfrac{x+6}{x-6}$

   C. $\dfrac{x+7}{x+6}$

   D. $\dfrac{x+7}{x-6}$

   E. $\dfrac{x-7}{x-6}$

6. A board 79 inches long is cut into 3 pieces. The second piece is 5 inches longer than the first. The third piece is twice as long as the second. If x represents the length of the first piece, then which equation can be used to determine the length of the first piece?
   A. 79 =- 5x+15
   B. 79 = x + (x + 5) + 2x
   C. 79 = 3x + 12
   D. 79 = x + (x + 5) + 2(x + 5)
   E. 79 = 4x + 12

7. The product of $(x^2 - 4)(x + 1)$ is
   A. $x^3 + 4x^2 - x - 4$
   B. $x^3 + 4x - 4$
   C. $4x^3 - 4$
   D. $x^3 - 4$
   E. $x^3 + x^2 - 4x - 4$

8. The statement “any integer evenly divisible by two is even” is
   A. always true
   B. never true
   C. true for positive integers only
   D. true for negative integers only
   E. true only if the integer is a perfect square

9. If $x = -2$, what is the value of $3x^2 + 4x - 2$?

A. –22
B. –6
C. 32
D. 2
E. –4

10. Which of the following is the complete factorization of $3x^2 + 10x - 8$?

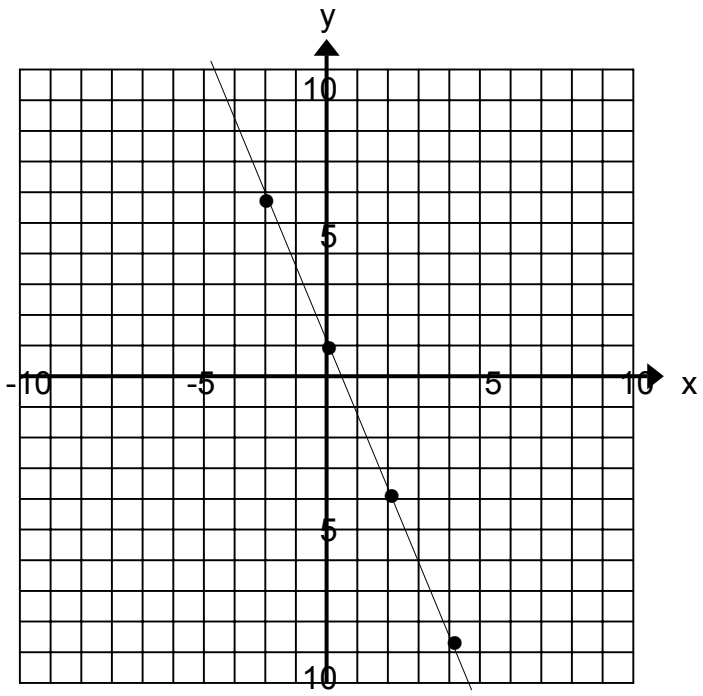
A. (3x +2)(x–4)
B. (3x – 1)(x+8)
C. (3x – 2)(x+4)
D. 3(x – 2)(x+4)
E. (x – 2)(x+12)

11. Which of these is the product of (x – y) and (2x + y)?

A. $2x^2 - xy + y^2$
B. $2x^2 - xy - y^2$
C. $x^2 + 2xy - y^2$
D. $2x^2 + xy - y^2$
E. $2x^2 - y^2$

12. If $x = -3$ and $y = 5$, what is the value of $2(x + 3y)(x - y)$?

A. 0
B. –192
C. 360
D. –72
E. 192



13. Which of the following equations is graphed above?

A. $y = -\frac{5}{2}x + 1$

B. $y = \frac{5}{2}x + 1$

C. $y = -\frac{2}{5}x + 1$

D. $y = \frac{2}{5}x + 1$

E. $y = -\frac{5}{2}x - 1$

14. Solve this equation: $3(x-4) - 2(x+1) = 10$

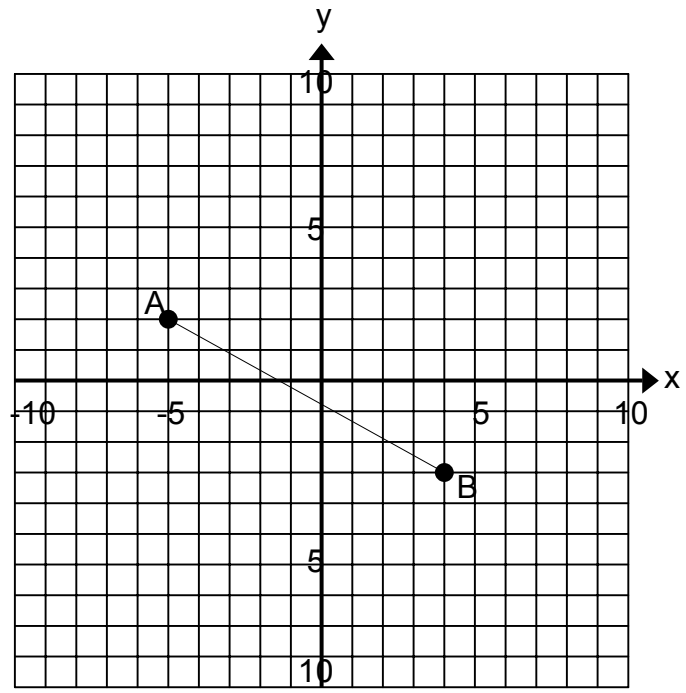
A. x = 23
B. x = 21
C. x = 24
D. x = 20
E. x = 16

15. A car salesman receives a weekly salary of W dollars plus a 6% commission on his total sales S. Which expression best describes his weekly pay?

A. W + S
B. (W + S) (0.6)
C. .06W +S
D. W + .06S
E. W + 6S

16. Which of these expressions is the product of $(y-5)(y^3-2y^2+2y+3)$?

A. $y^4+2y^3-2y^2+3y$
B. $y^4-7y^3-8y^2-7y-15$
C. $y^4+3y^3-8y^2+13y+15$
D. $y^4-7y^3-8y^2-7y-15$
E. $y^4-7y^3+12y^2-7y-15$



17. On the graph shown above, what is the distance from point A to point B?

A. 14
B. 106
C. $\sqrt{106}$
D. $\sqrt{14}$
E. 10

18. For all $x \neq 0$ and $y \neq 0$, simplify : $\frac{x^4 y^{-6}}{x^{-5} y^4}$

A. $\frac{x^9}{y^2}$

B. $\frac{x^9}{y^{10}}$

C. $\frac{x}{y^2}$

D. xy^2

E. $\frac{1}{xy^2}$

19. For all a, b, and c, simplify: $(ab^3c^4)^3$

A. ab^9c^{12}

B. $a^4b^6c^7$

C. $a^3b^9c^{64}$

D. $3ab^3c^4$

E. $a^3b^9c^{12}$

20. Solve this equation: 2(3x+1) – 3(x – 3) = 4(2x + 1) + 2

A. x = – 1

B. x = – 13/5

C. x = 1

D. x = 3/5

E. x = 0

Answers for Test 1:

1. B
2. D
3. A
4. B
5. E
6. D
7. E
8. A
9. D
10. C
11. B
12. B
13. A
14. C
15. D
16. E
17. C
18. B
19. E
20. C

SOLUTIONS TO PRACTICE TEST

1. If $x = 2$ and $y = -1$, what is the value of the expression $2y^3 + 3xy^2$?

   Answer: B

   Explanation:

$$2y^3 + 3xy^2$$
$$2(-1)^3 + 3(2)(-1)^2$$
$$2(-1) + 3(2)(1)$$
$$-2 + 6(1)$$
$$-2 + 6$$
$$4$$

2. Which of the following expressions represents the product of four less than three times x and two more than x?

   Answer: D

   Explanation:

   "Four less than three times x" 3x – 4
   and "two more than x" x + 2

   You are asked to multiply the two expressions.

$$(3x-4)(x+2) = 3x^2 + 6x - 4x - 8$$
$$= 3x^2 + 2x - 8$$

3. A student earned scores of 92, 89, and 79 on three of four exams. What must the student score on the fourth exam to have an average (arithmetic mean) of exactly 85?

   Answer: A

   Explanation:

$$\frac{(92+89+79+x)}{4} = 85$$
$$4 \cdot \frac{(92+89+79+x)}{4} = 4 \cdot 85$$
$$92+89+79+x = 340$$
$$260 + x = 340$$
$$x = 340 - 260$$
$$x = 80$$

4. What is the equation of the line that contains the points (3, 5) and (6, –2)?

Answer: B

Explanation:

All of the answers are in slope – intercept form, y = mx + b.
You xould find the slope first and then eliminate some answers.

The slope $m = \frac{y^2 - y^1}{x^2 - y^1} = \frac{-2-5}{6-3} = \frac{-7}{3}$.

Use the point (3,5) and the y = mx +b form to find the value of b.

$y = -\frac{7}{3}x + b$

$5 = -\frac{7}{3}(3) + b$

$5 = -7 + b$

$12 = b$

Therefore, the equation of the line is $y = -\frac{7}{3}x + 12$.

If you do not remember the slope formula and the slope – intercept form for a line, you could plug both points into the five equations and eliminate the distractors.

5. For all $x \neq \pm 6$, $\frac{x^2 - x - 42}{x^2 - 36} =$

Answer: E

Explanation:

This problem involves simplifying a rational expression and factoring.
Factor the numerator as (x – 7)(x + 6).
Factor the denominator as (x + 6)(x – 6).

Divide out the common factor of (x + 6), and the resulting expression is $\frac{x-7}{x-6}$.

$\frac{x^2 - x - 42}{x^2 - 36} = \frac{(x-7)\cancel{(x+6)}}{\cancel{(x+6)}(x-6)} = \frac{x-7}{x-6}$

6. A board 79 inches long is cut into 3 pieces. The second piece is 5 inches longer than the first. The third piece is twice as long as the second. If x represents the length of the first piece, then which equation can be used to determine the length of the first piece?

   Answer: D

Explanation:

Let x represent the length of the first piece. Then x + 5 represents the length of the second piece, and 2(x + 5) represents the length of the third.

x	x+5	2(x+5)

$79 - x + (x + 5) + 2(x + 5)$

Therefore, equation D, shown above, can be used to determine the length of the first piece.

7. The product of $(x^2 - 4)(x + 1)$ is

   Answer: E

   Explanation:

   This is the product of two binomials, so you can use the FOIL method.
   $(x^2 - 4)(x + 1) = x^3 + x^2 - 4x - 4$

8. The statement “any integer evenly divisible by two is even” is

   Answer: A

   Explanation:

   The statement represents the definition of an even integer, and therefore it is always true.

9. If $x = -2$, what is the value of $3x^2 + 4x - 2$?

Answer: D

Explanation:

$$3x^2 + 4x - 2?$$
$$3(-2)^2 + 4(-2) - 2$$
$$3(4) + 4(-2) - 2$$
$$12 - 8 - 2$$
$$4 - 2$$
$$2$$

10. Which of the following is the complete factorization of $3x^2 + 10x - 8$?

Answer: C

Explanation:

If you do not know how to factor this expression, you could FOIL each of the choices

11. Which of these is the product of (x – y) and (2x + y)?

Answer: B

Explanation:

FOIL the two binomials: $(x - y)(2x + y) = x^2 + xy - 2xy - y^2.$. Then combine the like terms to obtain $2x^2 - xy - y^2$.

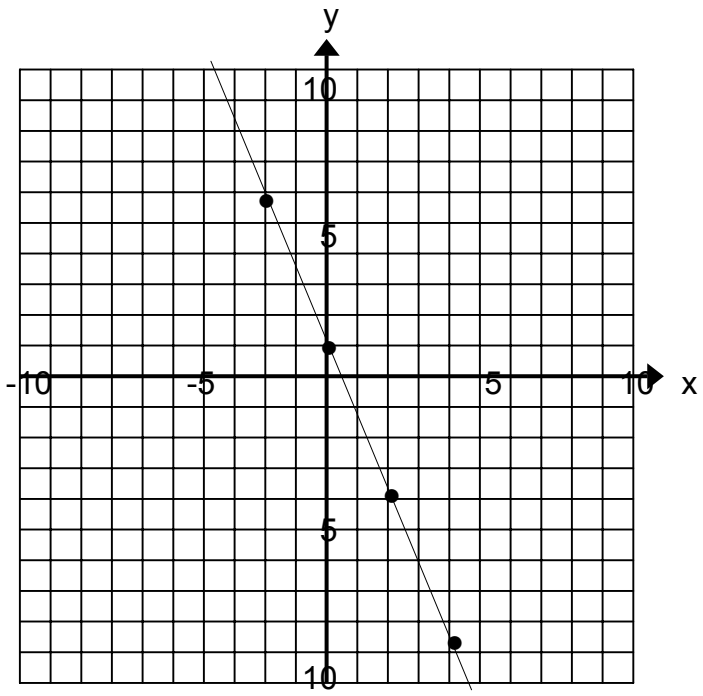
12. If $x = -3$ and $y = 5$, what is the value of $2(x + 3y)(x - y)$?

Answer: B

Explanation:

$$2[-3 + 3(5)](-3 - 5)$$
$$2(-3 + 15)(3 - 5)$$
$$2(12)(-8)$$
$$24(-8)$$
$$-192$$

Be careful to keep the negative sign on the –3. Also, remember that multiplication comes before addition on the –3 +3(5) expression, giving 12 not 0.



13. Which of the following equations is graphed above?

Answer: A

Explanation:

These equations are all written in slope-intercept form, y = mx + b.

Look at the graph and note the y-intercept is at (0, 1), so b = 1. therefore E is not the solution. From point (0, 1), you can go to the point (2, –4) by moving down 5 units (–5) and to the right two units (+2). Slope is the ration $\frac{\text{verticle change}}{\text{horizontal change}}$, so the slope is $\frac{-5}{2} = -\frac{5}{2}$, making the equation of this line $y = -\frac{5}{2}x + 1$.

14. Solve this equation: $3(x-4) - 2(x+1) = 10$

Answer: C

Explanation:

$$\begin{aligned} 3(x-4) - 2(x+1) &= 10 \\ 3x - 12 - 2x - 2 &= 10 \\ x - 14 &= 10 \\ x &= 24 \end{aligned}$$

Make certain that you distribute correctly. The most common mistake in this kind of problem occurs when the –2 is distributed incorrectly over (x + 1).

$$\begin{aligned} -2(x+1) &= -2(x) + (-2)(1) \\ &= -2x - 2 \end{aligned}$$

15. A car salesman receives a weekly salary of W dollars plus a 6% commission on his total sales S. Which expression best describes his weekly pay?

Answer: D

Explanation:

This can be done by the process of elimination.
Answer A is not correct because the 6% is not involved.
Answer B is not correct because the 6% should me multiplied by the sales only.
Answer C is not correct because the 6% is multiplied by the weekly salary instead of by the sales
Answer E is not correct because the 6% is not correctly converted to decimal form. $6\% = .06$.

Answer D is correct

16. Which of these expressions is the product of $(y-5)(y^3-2y^2+2y+3)$?

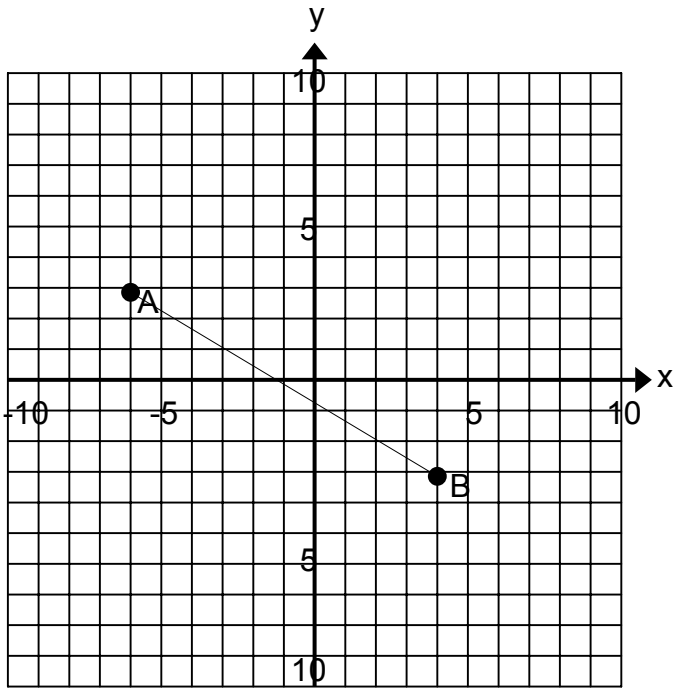
Answer: E

Explanation:

Each term in the binomial must be multiplied by each term in the second polynomial.
Multiplying by *y*: $y(y^3-2y^2+2y+3) = y^4-2y^3+2y^2+3y$
Multiplying by –5: $-5(y^3-2y^2+2y+3) = 5y^3+10y^2-10y-15$

$$\begin{array}{r} y^4-2y^3+2y^2+3y \\ -5y^3+10y^2-10y-15 \\ \hline y^4-7y^3+12y^2-7y-15 \end{array}$$

Combining the like terms:



17. On the graph shown above, what is the distance from point A to point B?

Answer: C

Explanation:

This question can be answered with the Distance Formula or the Pythagorean Theorem.

Using the Distance Formula, first determine the coordinates of the two points on the graph and plug those values into the distance formula.
Point A is (–5, 2) and Point B is (4, –3).

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$d = \sqrt{(4 - (-5))^2 + (-3 - 2)^2}$$

$$d = \sqrt{(9)^2 + (-5)^2}$$

$$d = \sqrt{81 + 25}$$

$$d = \sqrt{106}$$

Using the Phythagorean Theorem, you could note that segment AB is the hypotenuse of a right triangle with vertex at (–5, –3). You can see that the lengths of the legs of this triangle are 9 and 5 units. Plug those values into the Phythagorean Theorem.

$$a^2 + b^2 = c^2$$

$$9^2 + 5^2 = c^2$$

$$81 + 25 = c^2$$

$$106 = c^2$$

$$\sqrt{106} = c$$

18. For all $x \neq 0$ and $y \neq 0$, simplify: $\frac{x^4 y^{-6}}{x^{-5} y^4}$

Answer: B

Explanation:

Using the definition of negative exponents, $a^{-n} = \frac{1}{a^n} or \frac{1}{a^{-n}} = a^n$, make all exponents positivel Then using the rule for multiplying with exponents, $a^m \cdot a^n = a^{m+n}$, add the exponents of like bases.

$$\frac{x^4 y^{-6}}{x^{-5} y^4} = \frac{x^4 \cdot x^5}{y^4 \, y^6} = \frac{x^9}{y^{10}}$$

19. For all a, b, and c, simplify: $(ab^3c^4)^3$

Answer: E

Explanation:

To find the power of a product, raise each factor to the power: $(xy)^n = x^n y^n$, and to find the power of a power, multiply the exponents: $(x^m)^n = x^{mn}$

$(ab^3c^4)^3 = a^{1 \cdot 3} b^{3 \cdot 3} c^{4 \cdot 3} = a^3 b^9 c^{12}$

20. Solve this equation: 2(3x+1) – 3(x – 3) = 4(2x + 1) + 2

Answer: C

Explanation:

$$2(3x+1) - 3(x-3) = 4(2x+1) + 2$$

$$6x + 2 - 3x + 9 = 8x + 4 + 2$$ Use the distributive property.

$$3x + 11 = 8x + 6$$ Combine like terms.

$$11 = 5x + 6$$ Add –3x to both sides

$$5 = 5x$$ Add –6 to both sides

$$1 = x$$ Divide both sides by 5.

This study guide has been created to give students the opportunity to review concepts covered on the assessment test. This has been prepared as a general study guide an in no way represents every question you will have on the assessment.