6. (2) (0,−2) The line described must have a slope of $\frac{2}{3}$, meaning it rises 2 units for every 3 units it moves to the right. From Point *R*, count up 2 units and 3 to the right. You are at coordinates (0,−2), the *y*-intercept of the line.

GED Mini-Test • Lessons 20–22

(Pages 262–265)

Part 1

1. (3) Point *E* To find (4,−2), count 4 units to the right of the origin and then down 2 units.

2. (3) $\frac{1}{2}$ The line rises at it goes from left to right so the slope is positive. The line rises 3 units for every 6 units it runs to the right. Write the ratio and simplify. $\frac{3}{6} = \frac{1}{2}$

3. (1) $x > -2$ Solve the inequality.

$$5x + 2 < 6x + 3x + 10$$
$$5x + 2 < 9x + 10$$
$$-4x + 2 < 10$$
$$-4x < 8$$
$$x > -2$$

You must reverse the inequality sign when you divide both sides of the equation by −4.

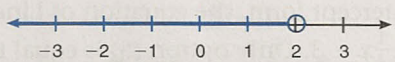
4. (2) 43, 45, and 47 You can eliminate options (3) and (4) since they do not list consecutive odd numbers. Use your calculator to add the numbers in the remaining options. Only the numbers in option (2) add up to 135.

5. (4) 31 Find the differences between the terms in the sequence:

0	1	increase of 1
1	3	increase of 2
3	7	increase of 4
7	15	increase of 8

Look at the list of increases. Each increase is double the one before it. The next increase must be 2 × 8 = 16. Add 16 to the last term in the sequence. 15 + 16 = 31

6. (3)



Solve the inequality.

$$x - 3 < -1$$
$$x < 2$$

In option (3) the portion of the number line to the left of 2 is shaded to show that all values less than 2 are solutions to the inequality. The number 2 has an open circle to show that 2 is not a solution.

7. (4) 4.7×10^{-1}, 2.34×10^{2}, 5.2×10^{2} Find the value of each expression.

$4.7 \times 10^{-1} = 0.47$ Move decimal 1 place left.

$2.34 \times 10^{2} = 234$ Move decimal 2 places right.

$5.2 \times 10^{2} = 520$ Move decimal 2 places right.

Compare the resulting values and put the original expressions in order from least to greatest.

8. (2) $(x - 6)(x - 6)$ Use the FOIL method to multiply each factor pair. Only option (2) equals the original expression.

$$(x - 6)(x - 6) = x^2 - 6x - 6x + 36 = x^2 - 12x + 36$$

9. (4) (−2,−11) Substitute the answer choices into the equation. Only option (4) makes the equation true.

$$5x - y = 1$$
$$5(-2) - (-11) = 1$$
$$-10 + 11 = 1$$
$$1 = 1$$

10. (3) *A*, *D*, and *F* One way to solve the problem is to find the coordinates of some of the points on the graph and substitute them in the given equation. If you choose this method, remember that it isn't necessary to try every point. Choose points that appear in only one or two choices in order to eliminate as many choices as possible.

Another way to solve the problem is to graph the equation on the grid. Notice that the equation is written in slope-intercept form, or $y = mx + b$, where m = slope and b = *y*-intercept. The *y*-intercept is (0,3), the location of point *D*. The slope is $\frac{-3}{2}$. To find another point on the line, start at point *D* and count down 3 and 2 to the right. You are now at point *A*. The correct option passes through points *A*, *D*, and *F*.

11. (2) 8 Use the distance formula.

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

Remember, it doesn't matter which point you choose to be (x_1,y_1) and (x_2,y_2). The solution below uses *A* (2,0) as (x_1,y_1) and *C* (−5,−4) as (x_2,y_2).

$$\text{distance} = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$
$$= \sqrt{(-5 - 2)^2 + (-4 - 0)^2}$$
$$= \sqrt{(-7)^2 + (-4)^2}$$
$$= \sqrt{49 + 16}$$
$$= \sqrt{65} \approx 8$$

(If you could not use a calculator, you would know that $\sqrt{65}$ is close to 8 ($\sqrt{64}$).)

12. (4) 1.14×10^{5} To write a number in scientific notation, move the decimal point until only one digit is to the left of the decimal point. In this case, you have to move the decimal point 5 places to the left, so the power of ten is 10^5.

Part 2

13. (1) −5 and 4 This is a quadratic equation. Either use factoring or simply substitute each answer choice into the equation until you find the correct one.

To use the factoring method, rewrite the equation so that the quadratic expression equals 0. Then factor.

$$x^2 + x = 20$$
$$x^2 + x - 20 = 0$$
$$(x + 5)(x - 4) = 0$$

Then find the value of x for each factor that will make that factor equal to 0.

$$x + 5 = 0 \qquad x - 4 = 0$$
$$x = -5 \qquad x = 4$$

14. (5) $392 Substitute 32 for s in the function and solve for p.

$$p = \$200 + \$6(32)$$
$$p = \$200 + \$192$$
$$p = \$392$$

15. (5) (2, 5) Substitute the answer choices into the equation. Only option (5) makes the equation true.

$$4x - y = 3$$
$$4(2) - 5 = 3$$
$$8 - 5 = 3$$
$$3 = 3$$

16. (4) between 15 and 16 feet

Since the area of a square equals the side squared, the side of a square equals the square root of the area. Try squaring the numbers in the answer choices to find the approximate square root of 240.

You know $12 \times 12 = 144$ and $20 \times 20 = 400$, so start with values between these two.

$14 \times 14 = 196 \quad 15 \times 15 = 225 \quad 16 \times 16 = 256$

$\sqrt{240}$ is between 15 and 16.

17. (2) *B* A line with a negative slope moves downward as it goes from left to right. The slope of Line A is undefined. Lines C and D have positive slopes, and the slope of Line E is 0.

18. (2) $\frac{5}{x-2}$ Factor each expression. Then simplify.

$$\frac{x + 4x}{x^2 - 2x} = \frac{x(1 + 4)}{x(x - 2)} = \frac{5}{x - 2}$$

Note: You can cancel x from the numerator and the denominator in the second step since $\frac{x}{x} = 1$.

19. (5) (3,6) Substitute the ordered pairs in the answer options until you find the one that does not make the equation true.

$$2x - y = -1$$
$$2(3) - 6 \neq -1$$

20. (1) $y = 2x + 2$ The answer choices are written in slope-intercept form $y = mx + b$, where m = slope and b = y-intercept. Remember, slope is the ratio of *rise over run*. Notice that the line rises 4 units and runs 2 units as it goes from Point A to Point B; therefore, the slope is $\frac{4}{2} = +2$. The y-intercept of the line, the point where the line crosses the y-axis, is +2. Therefore, the correct equation of the line is $y = 2x + 2$.

You could also solve the problem by finding the coordinates of two points on the line and substituting to find the correct equation. Always use two points since more than one line could pass through only one point.

21. (3) $c = \$40 + \$30h$ The charge for a service call is the sum of $40 (the flat fee) and the number of hours multiplied by $30. Only option (3) shows this sequence of operations.

22. (1) −3 Use the slope formula. Let $(-2,-2) = (x_1,y_1)$ and $(-4,4) = (x_2,y_2)$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$
$$m = \frac{4 - (-2)}{-4 - (-2)}$$
$$m = \frac{6}{-2} = -3$$

23. (4) $152 Each month an additional $12 is deposited. Continue adding $12 until you reach December, the 12th month. You can also solve the problem by multiplying $12 by 11, the number of increases, and adding $20, the beginning deposit. $11(\$12) + \$20 = \$152$

24. (4) $y = -x + 3$ The line moves downward 1 unit each time it goes to the right 1 unit for a slope of $\frac{-1}{1} = -1$. The y-intercept is +3. Use the slope-intercept form to write the equation of the line. $y = mx + b$, where m = slope and b = y-intercept.

$$y = -1x + 3, \text{ or } y = x + 3$$

25. (3) 5 Use the formula for finding the distance between two points. Let $D\ (1,3) = (x_1,y_1)$ and $F\ (4,-1) = (x_2,y_2)$.

$$\text{distance} = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$
$$= \sqrt{(4 - 1)^2 + (-1 - 3)^2}$$
$$= \sqrt{3^2 + (-4)^2}$$
$$= \sqrt{9 + 16}$$
$$= \sqrt{25} = 5$$

Unit 3 Cumulative Review (Pages 266–270)

Part 1

1. (2) −19 Substitute the values for x and y and solve.

$$4x - 2y + xy$$
$$4(-1) - 2(5) + (-1)(5)$$
$$-4 - 10 - 5 = -19$$

2. (2) $-x - 5$ Think of the subtraction operation as multiplying the contents of the parentheses by −1. $2 - (x + 7) = 2 + (-1)(x + 7) = 2 - x - 7 = -x - 5$