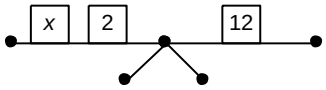
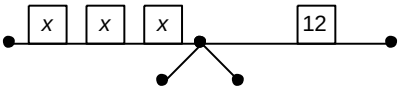
Unit 6 – Linear Equations & Graphing

Grade 8 Mathematics
Exam Review

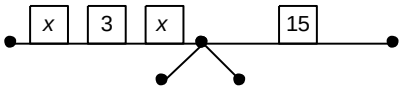
1. Use this balance-scales model to solve for *x*.



2. Use this balance-scales model to solve for *x*.

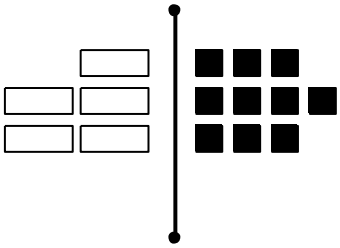


3. Use this balance-scales model to solve for *x*.

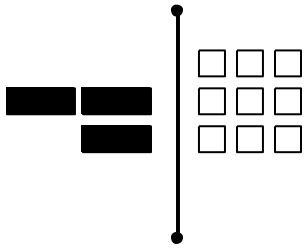


4. Solve this equation. $5t = 20$

5. A black square represents -1 and a white rectangle represents the variable *x*.
Find the value of *x*.



6. A white square represents +1, and a black rectangle represents the variable *-x*.
Find the value of *x*.



7. In the left pan of a set of balance-scales, there are 2 identical unknown masses and a mass of 18 g.
The scales are balanced by adding a mass of 24 g to the right pan.
Find the value of each unknown mass.

8. Solve this equation. $3x + 11 = 23$

9. Four more than three times a number is 16. Let *n* represent the number. Solve for *n*.

10. Four less than three times a number is 11. Let *n* represent the number. Solve for *n*.

11. Write an equation for this sentence.
40 less than a number is 10.

12. Write an equation for this sentence.
4 added to 4 times a number is 57.

13. Write an equation for this situation.
Patricia has *p* posters. She sold 8 and has 18 left.

14. Write an equation for this situation.
Each of 5 people contributed $*y* to buy a gift that costs $20.

15. Solve this equation. $4y + 8 = 36$

16. Solve this equation. $20 - 3x = 14$

17. Solve this equation. $-26 + 2x = -2$

18. Solve this equation. $12 - 4w = -16$

19. Solve this equation. $14 - 2x = 6$

20. Melissa has $300 to spend on school clothes.
She spends $100 on a coat and some sweaters that are on special for $20 each.
Solve the equation $100 + 20s = 300$ to find the greatest number of sweaters *s* that Melissa can buy.

21. Write an equation for this sentence.
A number divided by 4 is 11.

22. Write an equation for this sentence.
A number divided by -2 is 11.

23. Write an equation for this sentence.
Add 6 to a number divided by 3 and the answer is 16.

24. Solve this equation. $\frac{x}{-6} = -9$

25. Solve this equation. $9 + \frac{d}{4} = 23$

26. Solve this equation. $\frac{p}{5} - 9 = 14$

27. Solve this equation. $\frac{w}{8} - 4 = 0$

28. Solve this equation. $\frac{t}{-2} - 7 = 16$

29. Evaluate. $2(5 + 8)$

30. Evaluate. $-6(5 + 4)$

31. Expand. $4(x + 7)$

32. Expand. $-7(p + 3)$

33. Expand. $-5(4 + y)$

34. Expand. $-4(q - 2)$

35. Expand. $8(4 - t)$

36. Expand. $-6(5 - x)$

37. Which statement is correct?

i) $6(5 - x) = 30 - x$
ii) $6(5 - x) = 11 - 6x$
iii) $6(5 - x) = 30 - 6x$
iv) $6(5 - x) = 11 - x$

38. Which statement is correct?

i) $-3(-x + 4) = 3x + 12$
ii) $-3(-x + 4) = -3x - 12$
iii) $-3(-x + 4) = -3x + 12$
iv) $-3(-x + 4) = 3x - 12$

39. Solve this equation: $5(p - 5) = 10$

40. Solve this equation: $-24 = 4(z + 5)$

41. Solve this equation: $-5(a + 4) = 15$

42. Solve this equation: $40 = 10(-v + 9)$

43. Solve this equation: $5(t-4)=5$

44. Solve this equation: $-8=2(t-5)$

45. The price of an electronic puzzle was reduced by $7.
Mr. Murray bought 10 puzzles for his relatives. The total cost before taxes was $130.
What was the original price of the puzzle?

46. Doreen chose an integer. She added 4, then multiplied the sum by –3.
The product was –15. What integer did Doreen start with?

47. April chose an integer. She subtracted 6, then multiplied the difference by 3.
The product was 3. What integer did April start with?

48. Solve this equation: $4+2(x+5)=10$

49. Complete this table of values for the relation $y=x+3$.

x	1	2	3	4
y				

50. Complete this table of values for the relation $y=x+3$.

x	–3	–2	–1	0
y				

51. Complete this table of values for the relation $y=-x+3$.

x	1	2	3	4
y				

52. Complete this table of values for the relation $y=x-5$.

x	1	2	3	4
y				

53. Complete this table of values for the relation $y=-2+x$.

x	–4	–3	–2	–1
y				

54. Make a table of values for the relation $y = 3x - 6$ for x = 1, 2, 3, and 4.

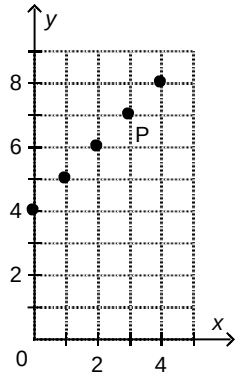
55. Make a table of values for the relation $y = 1 - 4x$ for x = 1, 2, 3, and 4.

56. The ordered pair (5,) is in the linear relation with equation $y = -2x + 8$.
Find the missing number in the ordered pair.

57. The ordered pair (, 5) is in the linear relation with equation $y = 3x - 4$.
Find the missing number in the ordered pair.

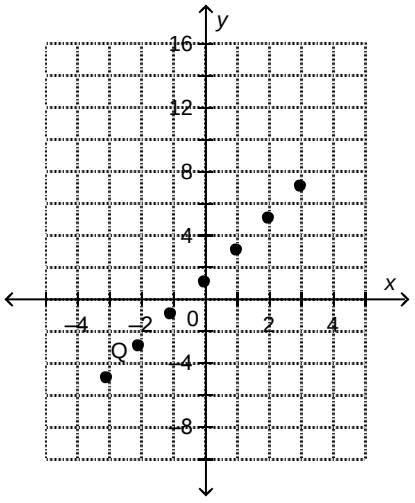
58. Marsha works part-time in a coffee shop and earns $12 per hour.
An equation for this relation is $w = 12h$, where h represents the number of hours Marsha worked and w represents her earnings in dollars. In one week Marsha earned $180.
How many hours did she work?

59. This graph shows the linear relation $y = x + 4$.



Write the ordered pair for point P.

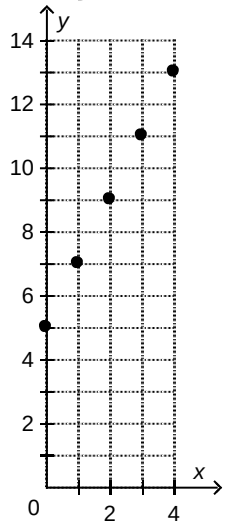
60. This graph shows the linear relation $y = 2x + 1$.



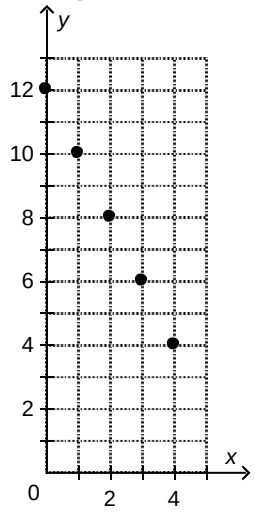
Write the ordered pair for point Q.

61. Graph the relation $y = -2x + 3$ for integer values of x from 0 to 4.

62. Describe the relationship between the variables x and y in this graph.
Graph of $y = 2x + 5$



63. Describe the relationship between the variables x and y in this graph.
Graph of $y = -2x + 12$



64. Complete this table of values for the linear relation $y = 3x - 5$.

x	0	1	2	3	4
y					

65. Complete the table of values for the linear relation $y = -2x + 11$.

x	0	1	2	3	4
y					

66. Which relations have graphs that are lines going up to the right?

i) $y = -5x + 3$
ii) $y = 5x + 3$
iii) $y = -5x - 3$
iv) $y = 5x - 3$

67. Which relations have graphs that are lines going down to the right?

i) $y = -5x + 2$
ii) $y = 5x + 2$
iii) $y = -5x - 2$
iv) $y = 5x - 2$

Unit 6 - Answer Key

1. 10

2. 4

3. 6

4. 4

5. -2

6. -3

7. 3 g

8. 4

9. 4

10. 5

11. $m - 40 = 10$

12. $4 + 4x = 57$

13. $p - 8 = 18$

14. $5y = 20$

15. 7

16. 2

17. 12

18. 7

19. 4

20. 10 sweaters

21. $\frac{x}{4} = 11$

22. $\frac{x}{-2} = 11$

23. $6 + \frac{x}{3} = 16$

24. 54

25. 56

26. 115

27. 32

28. -46

29. 26

30. –54

31. $4x + 28$

32. $-7p - 21$

33. $-20 - 5y$

34. $-4q + 8$

35. $32 - 8t$

36. $-30 + 6x$

37. iii

38. iv

39. 7

40. -11

41. -7

42. 5

43. 5

44. 1

45. $20.00

46. 1

47. 7

48. –2

49.

x	1	2	3	4
y	4	5	6	7

50.

x	–3	–2	–1	0
y	0	1	2	3

51.

x	1	2	3	4
y	2	1	0	–1

52.

x	1	2	3	4
y	–4	–3	–2	–1

53.

x	–4	–3	–2	–1
y	–2	–1	0	1

54.

x	1	2	3	4
y	–3	0	3	6

55.

x	1	2	3	4
y	–3	–7	–11	–15

56. –2

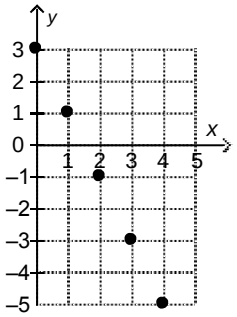
57. 3

58. 15

59. (3, 7)

60. (-2, –3)

61.



62. When *x* increases by 1, *y* increases by 2.

63. When *x* increases by 1, *y* decreases by 2.

64.

x	0	1	2	3	4
y	–5	–2	1	4	7

65.

x	0	1	2	3	4
y	11	9	7	5	3

66. ii and iv

67. i and iii