Chapter 4: Linear Relations Exam Review

Multiple Choice
Identify the choice that best completes the statement or answers the question.

____ 1. In the equation $P = 8n + 5$, determine the value of P when $n = 13$.
a. 144 b. 26 c. 105 d. 109

____ 2. The pattern in this table continues. Determine the expression that relates the number of triangles to the figure number.

Figure, *f*	1	2	3	4	5
Number of Triangles, *t*	2	4	6	8	10

a. $2f$ b. $2 + t$ c. $2t$ d. $2 + f$

____ 3. The cost to print stickers is \$6.55, plus \$0.55 per sticker.
Determine an equation that relates the total cost, C dollars, to the number of stickers, s.
a. $C = 0.55s$ b. $C = 6.55 + s$ c. $C = 6.55 + 0.55s$ d. $C = 7.1s$

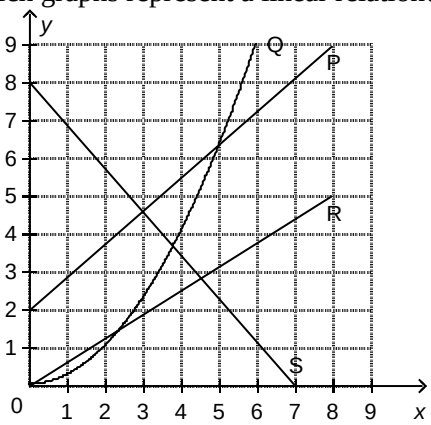
____ 4. The cost to rent a piece of equipment is \$27, plus \$4.27 per hour.
Calculate the cost of renting the equipment for 8 h.
a. \$39.27 b. \$61.16 c. \$250.16 d. \$922.32

____ 5. The pattern in this table continues. Determine an equation that relates the term value to the term number.

Term Number, *s*	1	2	3	4	5
Term Value, *w*	6	10	14	18	22

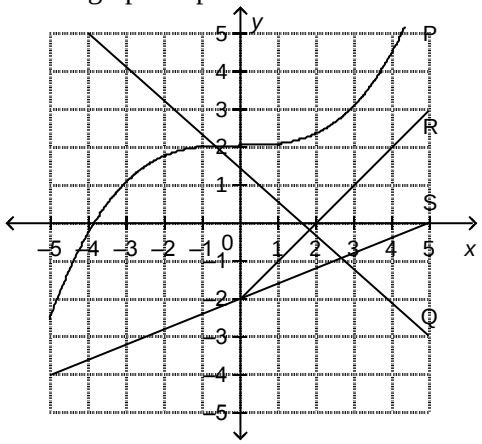
a. $w = 4s + 2$ b. $w = 6s$ c. $w = 3s + 2$ d. $w = 2s + 4$

____ 6. Which graphs represent a linear relation?



a. P only b. P and S c. P and R d. P, R, and S

____ 7. Which graphs represent a linear relation?



a. P and R
b. Q, R, and S
c. Q and S
d. Q and R

____ 8. Which tables of values represent a linear relation?

i)

x	1	2	3	4	5
y	3	6	11	18	27

ii)

x	0	1	2	3	4
y	0	3	6	9	12

iii)

x	1	2	3	4	5
y	5	9	13	17	21

iv)

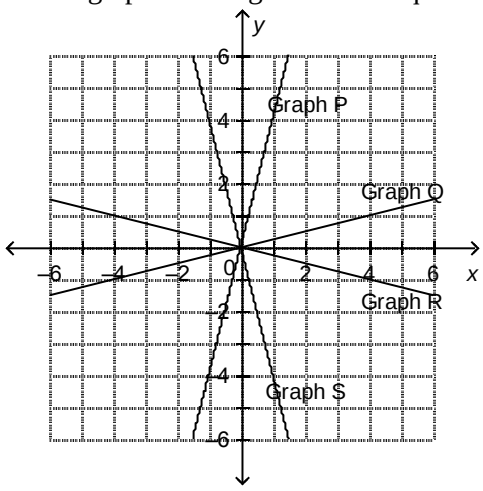
x	0	1	2	3	4
y	14	13	12	11	10

a. i and iv
b. ii, iii, and iv
c. All of these
d. ii and iii

____ 9. Which points lie on the graph represented by the equation $y = 12 - 5x$?
P(1, 7), Q(2, 14), R(2, 2), S(0, 7)
a. Q and R
b. P and Q
c. P and R
d. R and S

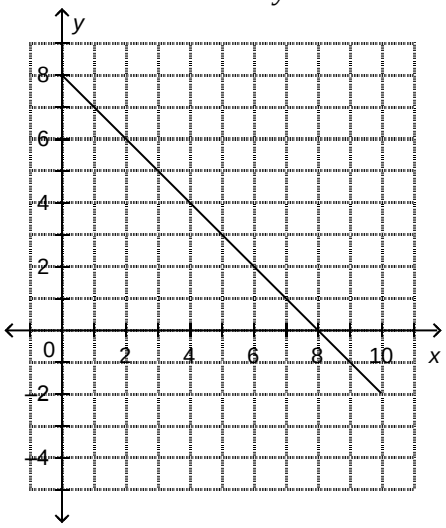
____ 10. Describe the graph of the equation $x + 8 = 0$.
a. A vertical line that intersects the x-axis at 8.
b. A horizontal line that intersects the y-axis at –8.
c. A vertical line that intersects the x-axis at –8.
d. A horizontal line that intersects the y-axis at 8.

____ 11. Which graph on this grid has the equation $y = 4x$?



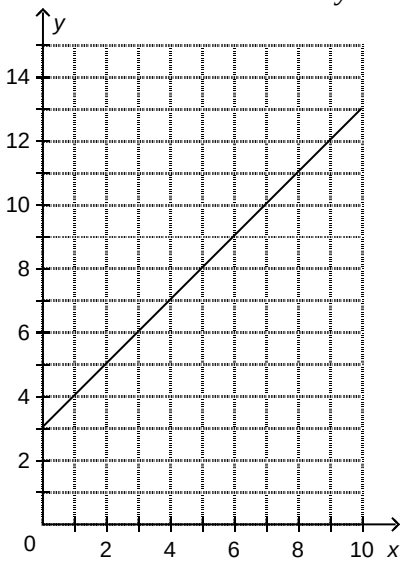
a. Graph Q b. Graph R c. Graph S d. Graph P

____ 12. This graph represents a linear relation.
Determine the value of y when $x = 6$.



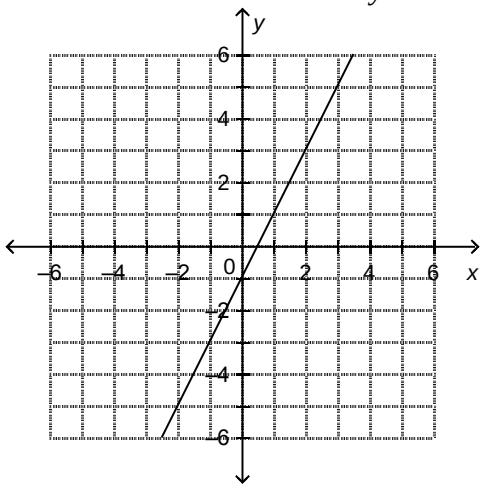
a. 2 b. 0 c. 8 d. 14

____ 13. This graph represents a linear relation.
Determine the value of x when $y = 5$.



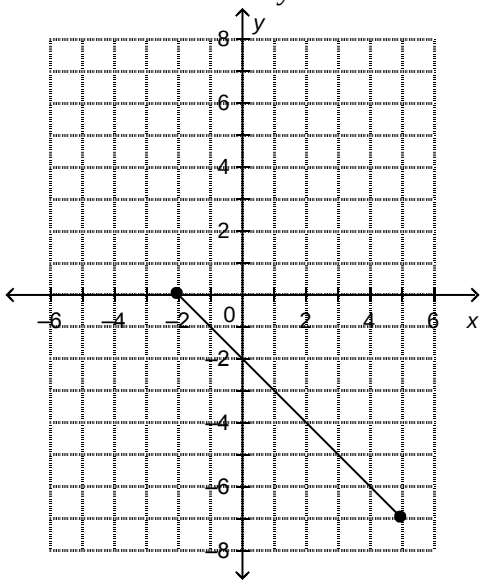
a. 8 b. 3 c. 2 d. 5

____ 14. This graph represents a linear relation.
Determine the value of x when $y = -2$.



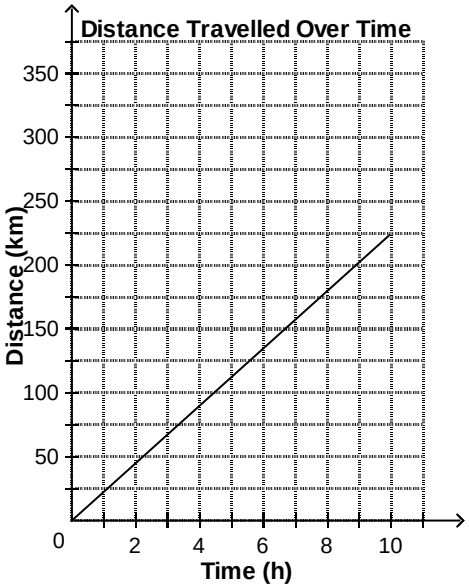
a. –1 b. –0.5 c. 0.5 d. –1.5

____ 15. This graph represents a linear relation.
Determine the value of y when $x = -4$.



a. 1 b. 0 c. 2 d. 6

____ 16. A car travels at a constant speed.
The graph shows how the distance of the car changes with time.
Estimate the time it takes to travel 270 km.



a. 1 h b. 12 h c. 13 h d. 11 h

Short Answer

17. In the equation $R = 6(w - 1) + 4$, determine the value of R when $w = 13$.

18. The pattern in this table continues. Write an equation that relates the term value to the term number.

Term Number, *t*	1	2	3	4	5
Term Value, *w*	5	8	11	14	17

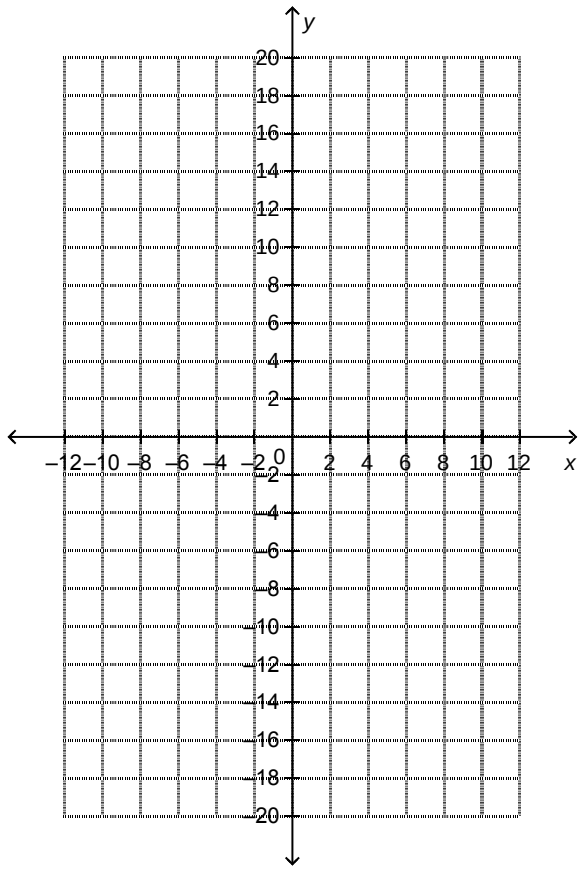
19. Shirley has $540 in her bank account. She withdraws $35 each week to cover her expenses.
    a) Write an equation that relates the amount of money in her account, *A* dollars, after *n* weeks.
    b) Determine the amount of money in Shirley's account after 8 weeks.

20. The cost of a taxi ride is the sum of a fixed cost of $2.50 for the first kilometer, plus $1.75 for each additional kilometer.
    a) Write an equation that relates the cost of a taxi ride, *F* dollars, to the distance travelled, *n*.
    b) Determine the cost of a 28-km taxi ride.

21. Which equations represent a linear relation?
    i) $y = 6x^2$
    ii) $y = 7x + 4$
    iii) $y = \frac{12}{x}$
    iv) $y + 3x = 12$

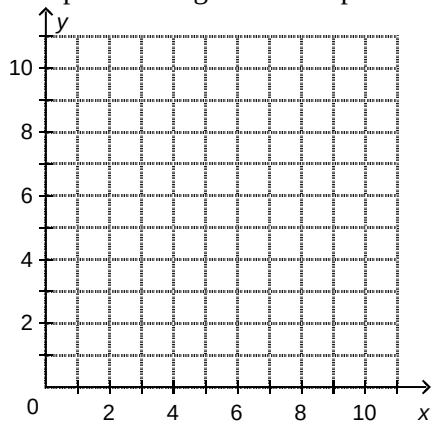
22. Create a table of values for the linear relation $y = 4 - 4x$, then graph the relation.
Use values of *x* from 0 to 6.

x	0	1	2	3	4	5	6
y							



23. Dorina is having a party. She estimates that she will need 5 sandwiches for each guest, and 12 extra sandwiches for unexpected guests.
    a) Write an equation that relates the total number of sandwiches, *T*, to the number of guests, *p*.
    b) How many sandwiches will Dorina need for 16 guests?

24. a) Graph the straight line that passes through the points (0, 10), (3, 7), and (10, 0).



b) Write an equation to describe the line.

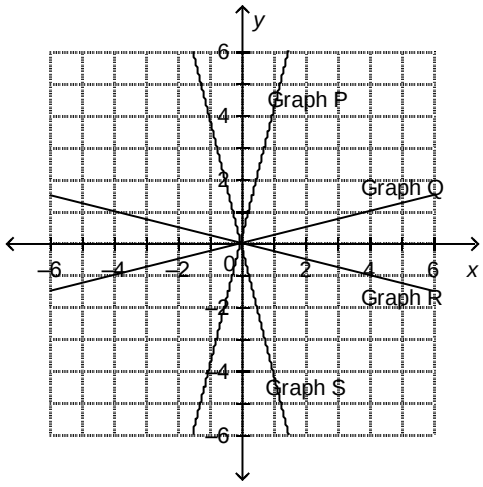
25. Match each equation with a graph on the grid below.

i) $y = -0.25x$

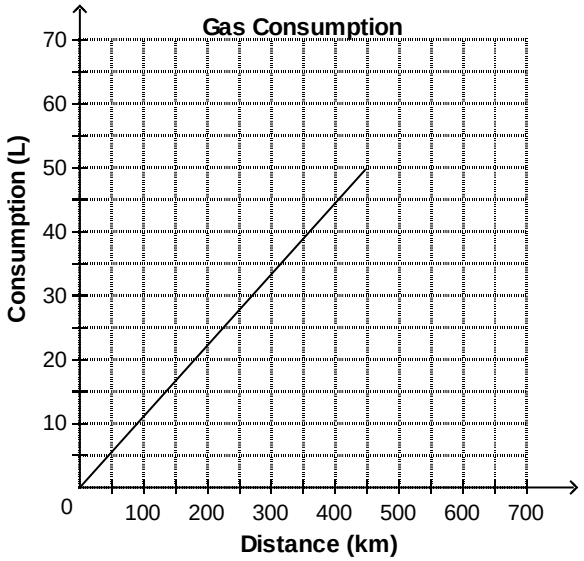
ii) $y = 4x$

iii) $y = -4x$

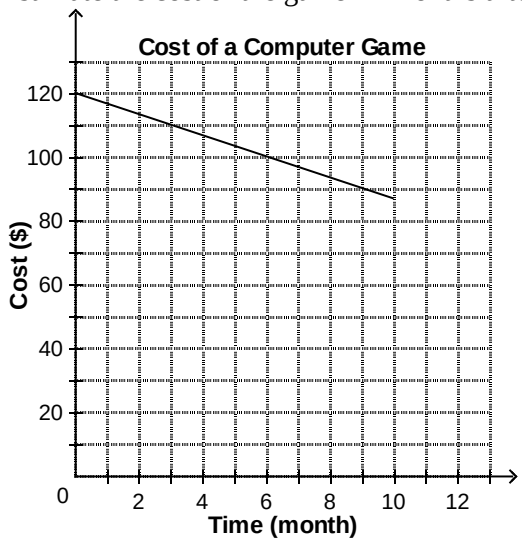
iv) $y = 0.25x$



26. This graph shows the gas consumption rate of a car.
    a) Estimate the volume of gas required to travel 630 km.
    b) Estimate the distance the car can travel on 60 L of gas.



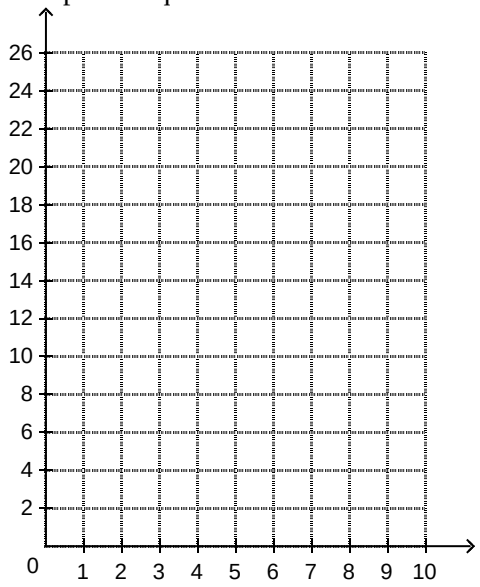
27. This graph shows how the cost of a new computer game changes with time.
    Estimate the cost of the game 12 months after it is released.



Problem

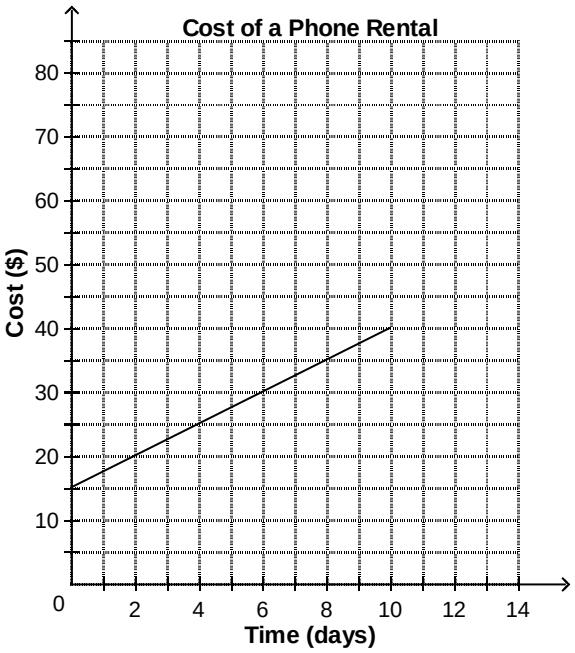
28. A phone company charges a fixed cost of $2.35 per month, plus $0.53 per minute for local calls and $1.07 per minute for long distance calls.
    a) Write an equation that relates the total monthly cost, *B* dollars, to the local calls, *p* minutes, and long distance calls, *q* minutes.
    b) Determine the phone bill for a month in which 53 min of local calls and 31 min of long distance calls were made.

29. Amir went to a pie-tasting festival. The festival charges an admission fee of $3.00, plus $2.00 for every slice of pie you eat.
    a) Write an equation that relates the total cost, *C* dollars, to the number of slices of pie you eat, *r*.
    b) Graph the equation. Which variable will you plot on the horizontal axis? Explain your reasoning.



    c) Will you join the points on the graph? Explain.
    d) If Amir spent $17.00, how many slices of pie did he eat?

30. A resort rents out mobile phones by the day. This graph shows how the cost to rent a phone relates to the number of days the phone is rented.
    a) Estimate the cost to rent a phone for:
        i) 1 day
        ii) 13 days
    b) A customer paid $35.00 to rent a phone. For how many days did the customer rent the phone?



Exam Review Chapter 4
Answer Section

MULTIPLE CHOICE

1. D 2. A 3.C 4. B 5. A 6. D 7. B 8.B 9.C 10. C 11. D

12.A 13.C 14.B 15.C 16.B

SHORT ANSWER

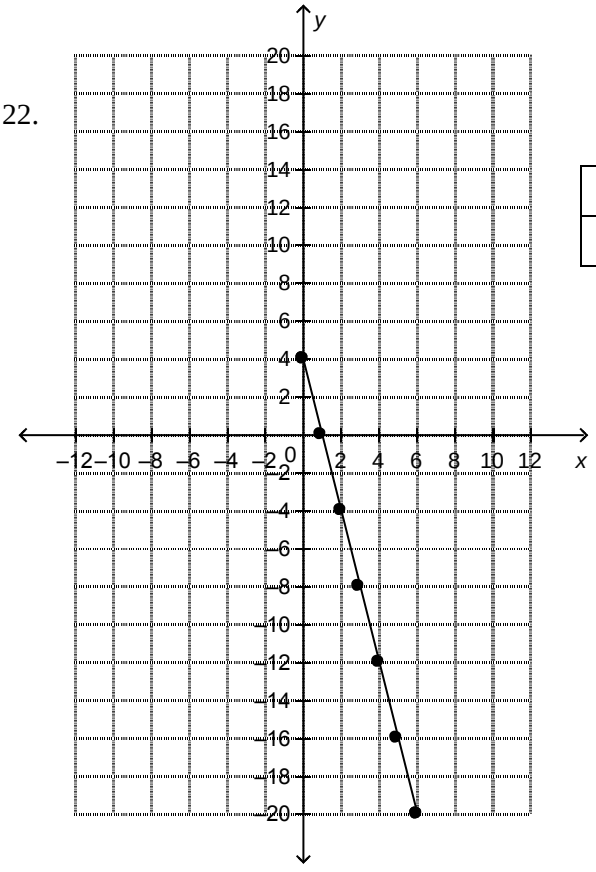
17. $R = 76$ 18. $w = 3t + 2$

19.a) $A = 540 - 35n$ 20.
b) \$260

20 a) $F = 2.5 + 1.75n$
b) \$51.50

21.ii and iv

22.

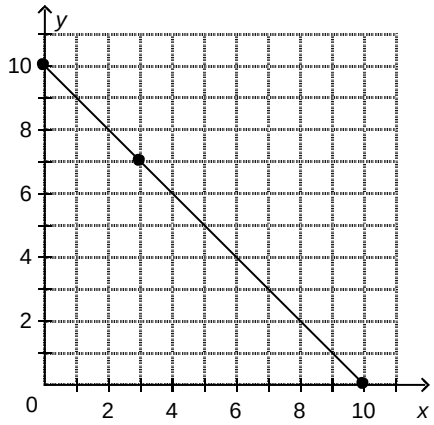


x	0	1	2	3	4	5	6
y	4	0	–4	–8	–12	–16	–20

23.
a) $T = 5p + 12$
b) 92 sandwiches

24.

a)



b) $x + y = 10$

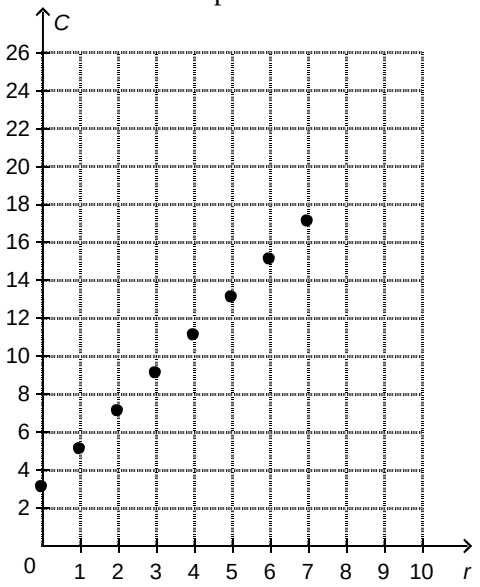
25) Graph P: $y = 4x$
Graph Q: $y = 0.25x$
Graph R: $y = -0.25x$
Graph S: $y = -4x$

26. a) 70 L
b) 540 km

27.a) $80

28. a) $B = 2.35 + 0.53p + 1.07q$
b) $B = 2.35 + 0.53(53) + 1.07(31) = 63.61$
The phone bill for that month is $63.61.

29. a) $C = 3 + 2r$
b) Since the cost depends on the number of slices of pie you eat, plot *r* horizontally and *C* vertically.



c) I will not join the points because the data are discrete.
d) Amir ate 7 slices of pie.
KEY: Problem-Solving Skills | Communication

30. ANS:
a) i) It costs $17.50 to rent a phone for 1 day.
ii) It costs $47.50 to rent a phone for 13 days.
b) The customer rented the phone for 8 days.