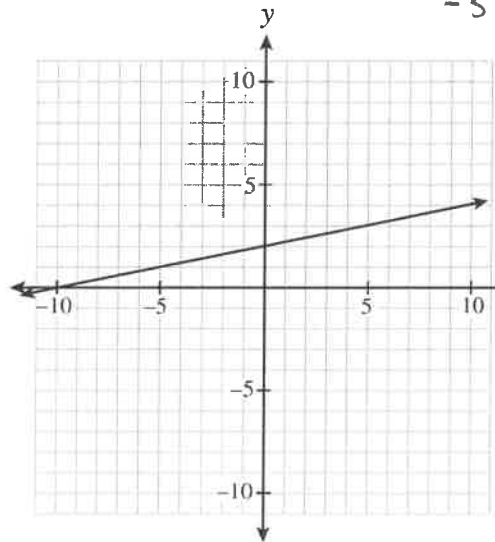Pull 3T. No

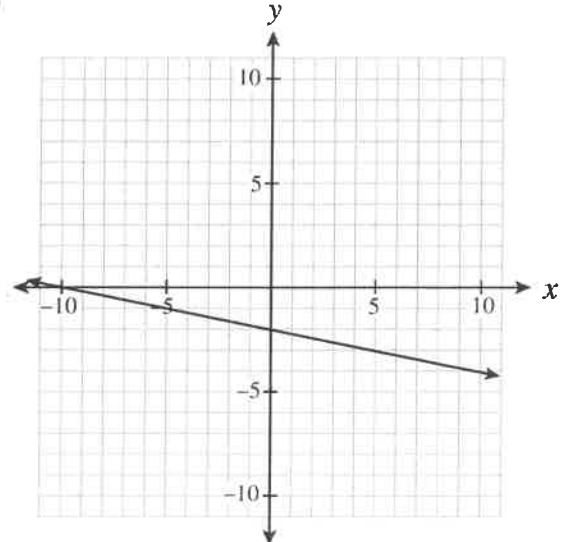## FMP 10 Final Exam Review

Part A: Multiple Choice Questions
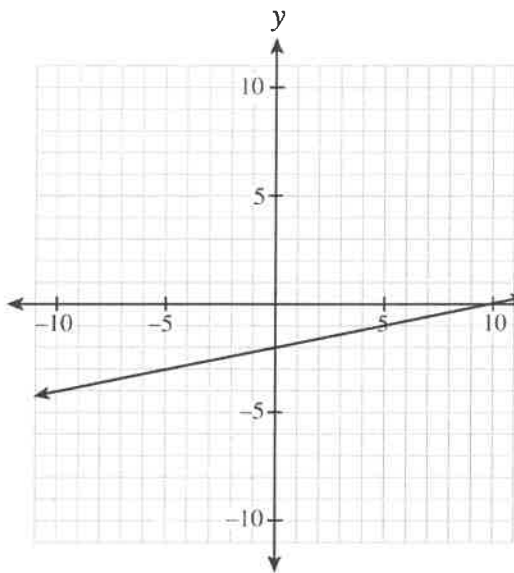
1. Which graph represents the relation $x - 5y + 10 = 0$

$-5y = -10$

$y = 2$

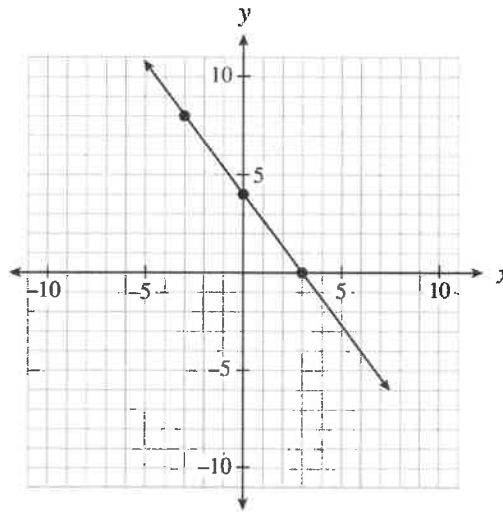$x = -10$

a)

b)

c)
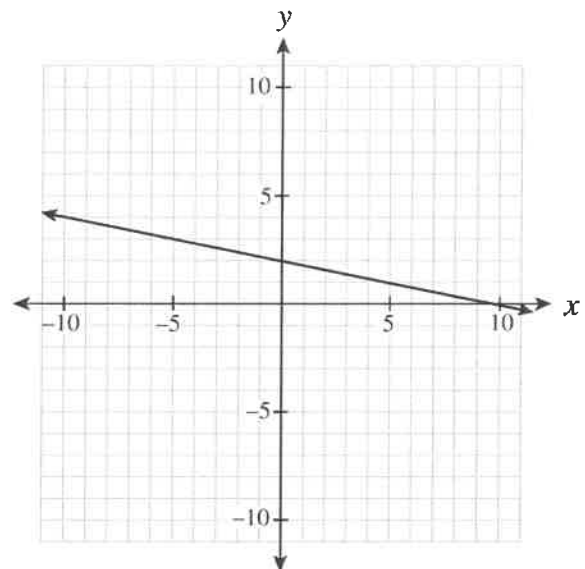
d)

Use the following graph to answer question 2

2. Which of the following equations describes the linear relation graphed above?

I.	$y = \frac{4}{3}x + 4$	✗
II.	$y - 8 = -\frac{4}{3}(x+3)$	✓
III.	$4x + 3y - 12 = 0$	✓

a) II only
b) I and II only
c) I and III only
d) II and III only

$3y - 24 = -4(x+3)$

$3y - 24 = -4x - 12$

$4x + 3y - 12 = 0$

3. Determine the equation of a line, in slope-intercept form, that passes through the points (6, 1) and (-10, 9).

a) $y = -\frac{1}{2}x + 4$
b) $y = -\frac{1}{2}x - 2$
c) $y = -2x + 8$
d) $y = -2x + 13$

$\frac{9-1}{-10-6} = \frac{8}{-16} = \frac{-1}{2}$

$1 = -\frac{1}{2}(6) + b$

$1 = -3 + b$

$4 = b$

4. Solve for y in the following system of equations:

$$x - y = -1$$
$$3x + 5y = 21$$

a) 2
b) 3
c) 9
d) 12

$x = y - 1$

$3(y-1) + 5y = 21$

$3y - 3 + 5y = 21$

$8y = 24$

$y = 3$

5. The cost C, in dollars, of renting a hall for the prom is given by the formula $C(n) = 500 + 4n$ where n is the number of students attending the prom. Calculate the cost of renting the hall if 70 students attend.

$C(70) = 500 + 4(70)$
$= 500 + 280$
$= 780$

a) $108
b) $500
c) $780
d) $970

6. Which of the following statements are true?

I.	$\sqrt{\sqrt{4}} = 2$ since $2 \times 2 = 4$
II.	$\sqrt{8} = 4$ since $4 + 4 = 8$
III.	$\sqrt[3]{27} = 3$ since $3 \times 3 \times 3 = 27$
IV.	$\sqrt[3]{81} = 9$ since $9 \times 9 = 81$

a) I and III only
b) I and IV only
c) II and III only
d) II and IV only

7. Which of the following statements are true?

I.	The factors of 24 are 2, 3, 4, 6, 8 and 12. ✗
II.	The prime factorization of 24 is $2^3 \times 3^1$. ✓
III.	The prime factors of 24 are 2 and 3. ✓
IV.	$\sqrt{24}$ is an irrational number. ✓

a) I and IV only
b) II and III only
c) II, III and IV only
d) I, II, III and IV

8. Which pattern could be used to predict 3^{-4}?

a)

3^3	27
3^2	9
3^1	3
3^0	1
3^{-1}	$\dfrac{1}{3}$
3^{-2}	$\dfrac{1}{9}$
3^{-3}	$\dfrac{1}{27}$

b)

3^3	9
3^2	6
3^1	3
3^0	0
3^{-1}	$-\dfrac{1}{3}$
3^{-2}	$-\dfrac{1}{6}$
3^{-3}	$-\dfrac{1}{9}$

c)

3^3	27
3^2	9
3^1	3
3^0	1
3^{-1}	-3
3^{-2}	-9
3^{-3}	-27

d)

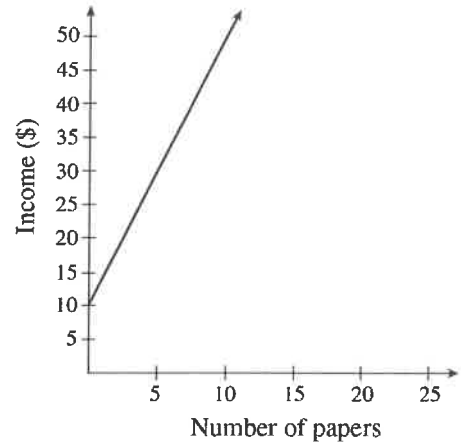|	
3^3	9
3^2	6
3^1	3
3^0	0
3^{-1}	-3
3^{-2}	-6
3^{-3}	-9

9. Jim delivers newspapers. He gets 10 dollars for every day of work, plus 5 cents for every paper he delivers. Which of the following graphs best represents Jim's possible income for one day?
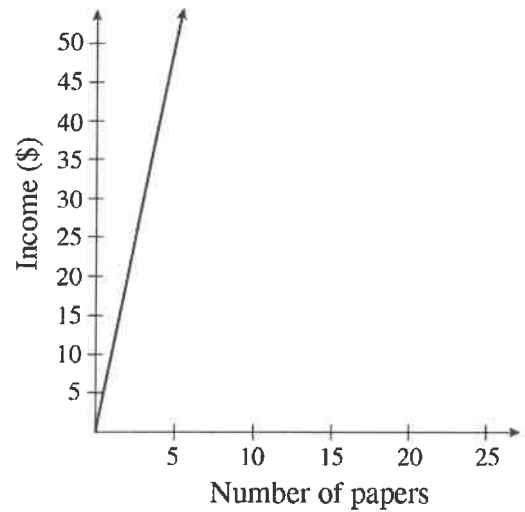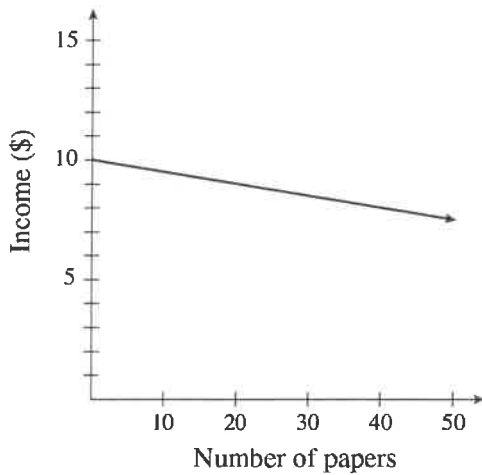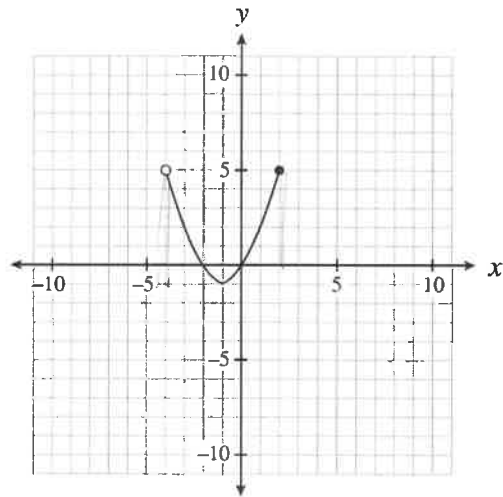
a)

c)

b)

d)
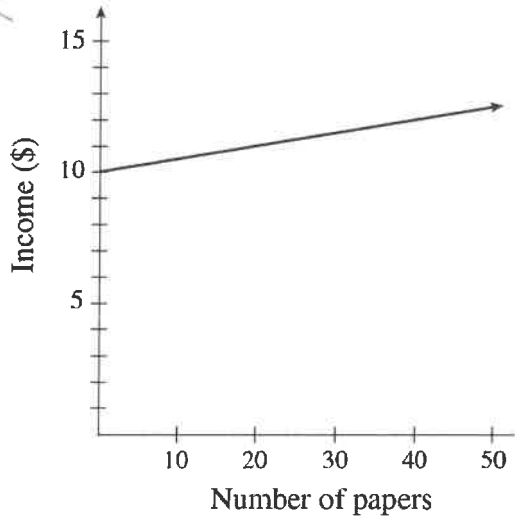
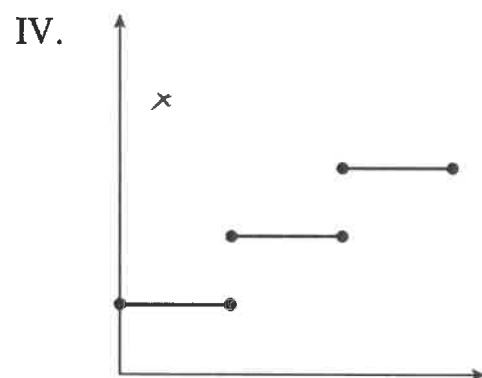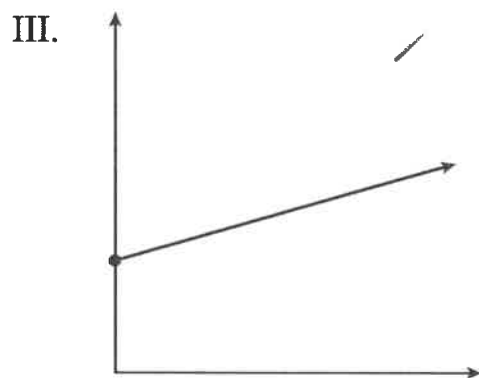10. Determine the domain of the relation graphed below?

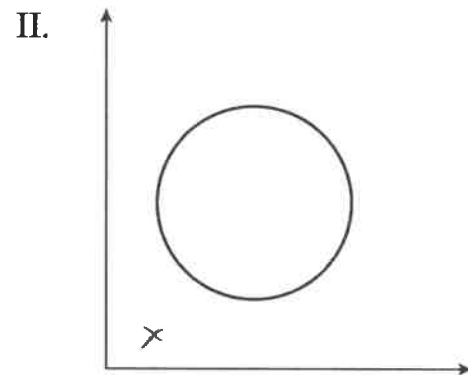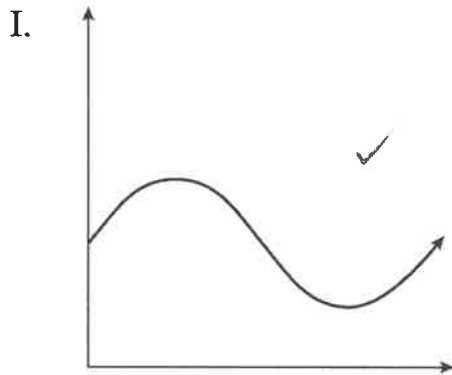(a) (-4, 2]   b) [-4, 2)   c) [-1, 5)   d) [-1 ,5]

11. Which of following relations are also functions?

I.

II.

III.

IV.

a) III only   (b) I and III only   c) II and IV only   d) I, III and IV only

12. Calculate the slope between the points (7, -3) and (4, 3)

a) 2

b) $-\frac{1}{2}$

c) 2

d) 10

$$= \frac{3 - -3}{4 - 7}$$

$$= \frac{6}{-3}$$

$$= -2$$

13. Use a ruler to determine the slope of the roof shown below.
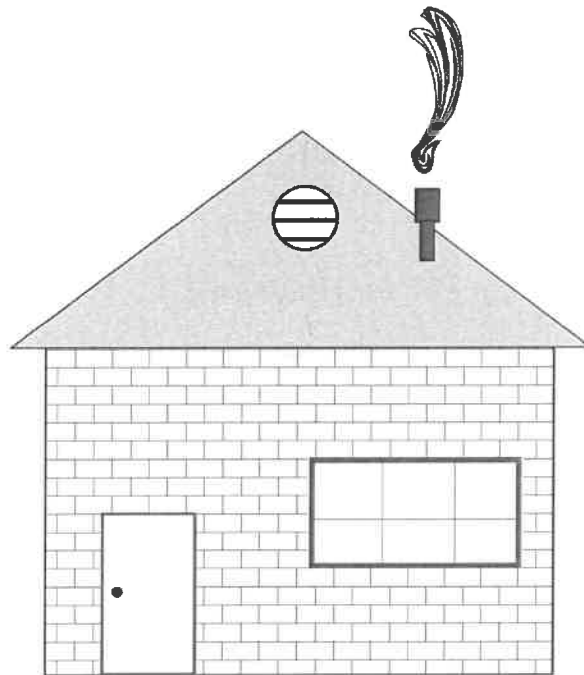
Note: This diagram is drawn to scale.

a) $\frac{3}{8}$

b) $\frac{3}{4}$

c) $\frac{4}{5}$

d) $\frac{4}{3}$

14. A line with an undefined slope passes through the points (-2, 1) and (p, q). Which of the following points could (p, q)?   x =

a) (1, 0)

b) (0, 1)

c) (0, -2)

d) (-2, 0)

Use the graph below to answer question 15.

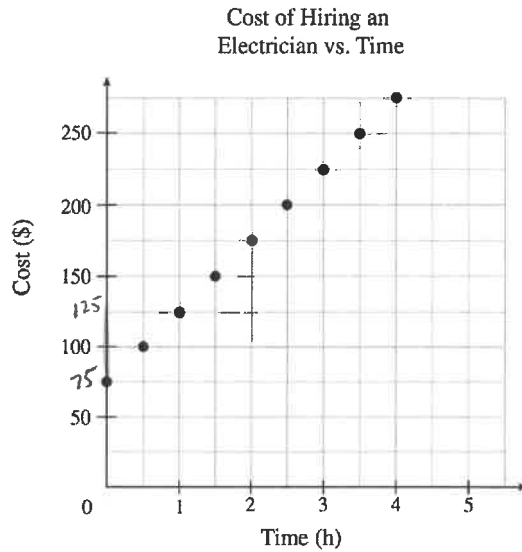Cost of Hiring an
Electrician vs. Time

15. What is the cost of hiring an electrician for <u>8 hours</u>?

a) $550

b) $475

c) $400

d) $275

$50h + 75$

$50(8) + 75$

$400 + 75$

16. Two isosceles triangles have the same height. The slopes of sides of triangle A are double the slopes of the corresponding sides of triangle B. How do the lengths of their bases compare?

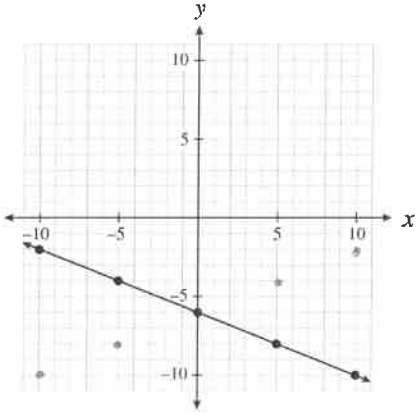a) The base of A is quadruple that of B.

b) The base of A is double that of B.

c) The base of A is half that of B.

d) The base of A is one quarter that of B.

17. Which of the following relations could be produced by $y = \frac{2}{5}x - 6$?

I.	$2x - 5y - 30 = 0$
II.	$\{(15, 0), (10, -2), (-5, -8), (-10, -10)\}$
III.	

Handwritten: $2x - 5y - 30 = 0$

a) I only
b) II only
c) I and II only
d) I, II, and III

18. Determine the slope of the linear relation $3x + 5y + 15 = 0$.
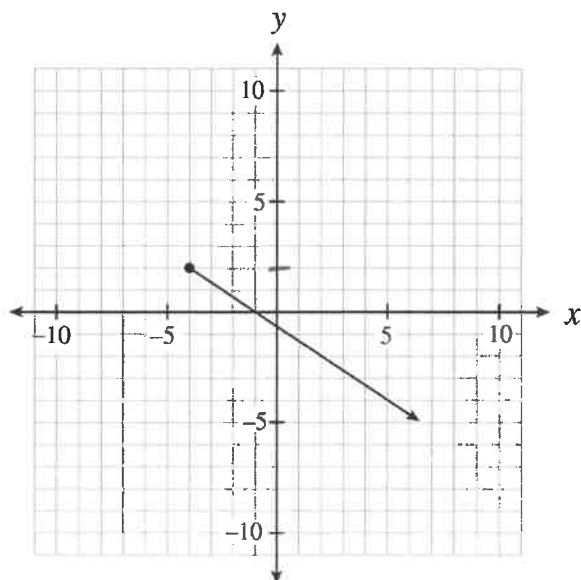
a) $\frac{5}{3}$

b) $\frac{3}{5}$

c) $-\frac{3}{5}$

d) $-\frac{5}{3}$

Handwritten: $5y = -3x - 15$

Handwritten: $y = -\frac{3}{5}x - 3$

19. Determine the range of the linear relation graphed below.

a) $y \leq -4$
b) $y \leq 2$
c) $y \geq -4$
d) $y \geq 2$

20. Which of the following coordinates are intercepts of the linear relation $2x - 3y + 30 = 0$?

I.	$(0, 10)$ ✓
II.	$\left(0, \frac{2}{3}\right)$
III.	$(-10, 0)$
IV.	$(-15, 0)$ ✓

y-int
$2(0) - 3y + 30 = 0$
$30 = 3y$
$10 = y$

x-int
$2x - 3(0) + 30 = 0$
$2x = -30$
$x = -15$

a) I only
b) I and IV only
c) II and III only
d) II and IV only

21. Kelly explained her method for graphing the linear relation $y = -\frac{2}{3}x + 7$ as follows:

Steps	
I.	Place a dot on the y-axis at positive 7.
II.	Move up two on the y-axis to positive 9.
III.	From the positive 9, move to the left three spots and place a dot there.
IV.	Draw a line through the two dots.

Where did Kelly make the first mistake in her explanation?

a) Step I
b) Step II
c) Step III
d) There is no mistake

22. Alex bought 144 bagels for $80. His profit was $75 once he had sold 100 bagels. Which equation below represents Alex's profit P, as a function of the number sold, n?

a) $P = -0.05n + 80$

b) $P = 0.05n + 80$

c) $P = 0.75n$

d) $P = 1.55n - 80$

23. Determine the slope-intercept equation of the line that is parallel to $y = \left(\frac{2}{5}\right)x - 3$ and passes through the point (0, 5).

a) $y = -\frac{5}{2}x - 3$

b) $y = -\frac{5}{2}x + 5$

$5 = \frac{2}{5}(0) + b$

c) $y = \frac{2}{5}x + 3$

d) $y = \frac{2}{5}x + 5$

24. The cost to insure jewelry is a fixed amount plus a percentage of the value of the jewellery. It costs $32 to insure $1000 worth of jewelry or $44.50 to insure $3500 worth of jewellery. What is the fixed amount to insure jewelry?

a) $27.00

b) $31.25

c) $44.65

d) $58.82

25. Lines A and B are perpendicular and have the same x-intercept. The equation of line A is $x + 2y - 4 = 0$. Determine the y-intercept of line B.

a) -8

b) -2

c) 4

d) 8

$$2y = -x + 4$$

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

$$\boxed{m_\perp = 2}$$

x-int

$$x + 2(0) - 4 = 0$$

$$x = +4$$

$$(+4, 0)$$

$$0 = 2(+4) + b$$

$$-8 = b$$

26. Which of the following systems of linear equations has a solution of (-3, 4)?

a) $\begin{cases} 2x - 3y = 6 \\ y = 3x - 13 \end{cases}$

b) $\begin{cases} 2x - 3y = 6 \\ y = 3x + 13 \end{cases}$

c) $\begin{cases} 2x + 3y = 6 ✓ \\ y = 3x - 13 ✗ \end{cases}$

d) $\begin{cases} 2x + 3y = 6 ✓ \\ y = 3x + 13 \end{cases}$

$$2(-3) - 3(4) = 6$$

$$-6 - 12 =$$

$$-18 = ✗$$

$$2(-3) + 3(4) = 6$$

$$-6 + 12 = 6$$

$$6 = 6 ✓$$

$$4 = 3(-3) + 13$$

$$4 = -9 + 13$$

$$4 = 4 ✓$$

27. Two planes have a cruising speed of 570 km/h without wind. The first plane flies for 12 hours against a constant headwind. The second plane flies for 10 hours in the opposite direction with the same wind (a tailwind). The second plane flies 370 km less than the first plane.

Determine two equations that could be used to solve for the wind speed, w and the distance travelled by the first plane, d.

a) $(570 - w)(12) = d$
   $(570 + w)(10) = d - 370$

b) $(570 - w)(12) = d$
   $(570 + w)(10) = d + 370$

c) $(570 + w)(12) = d$
   $(570 - w)(10) = d - 370$

d) $(570 - w)(12) = d$
   $(570 - w)(10) = d + 370$

28. Which two numbers have the following properties?

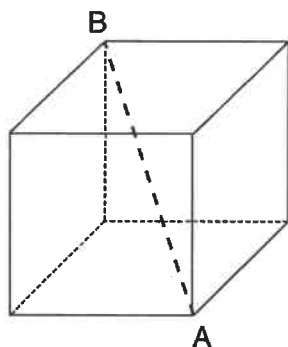   - Their GCF is 12.

   - Their LCM is 72.

a) 2 and 3

b) 24 and 36

c) 48 and 72

d) 72 and 864

29. Polar Company has designed an ice block in the shape of a cube. The volume of the cube is 15 625 cm³. Which of the following dimensions is the smallest opening of an ice dispenser that will accommodate length AB?

B

A

a) 25 cm wide
b) 40 cm wide
c) 45 cm wide
d) Over 50 cm wide

30) Chantal made a mistake in simplification of $\frac{(3a^5)^{-2}}{a^4}$

	Steps
I.	$\dfrac{1}{(3a^5)^2(a^4)}$
II.	$\dfrac{1}{(3)^2(a^5)^2(a^4)}$
III.	$\dfrac{1}{(9)(a^7)(a^4)}$
IV.	$\dfrac{1}{9a^{28}}$

Which step contains her first mistake?

a) Step I
b) Step II
c) Step III
d) Step IV

31) Simplify: $\left(\frac{25x^a}{125x^3}\right)^3$

$\left(\dfrac{1x^{a-3}}{5}\right)^3$

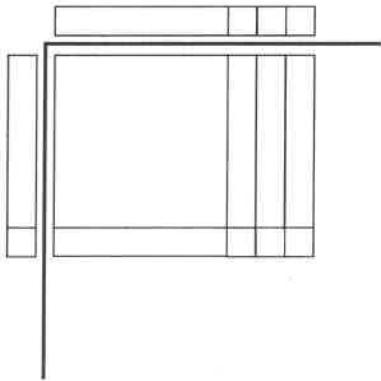a) $\dfrac{x^{3a-9}}{125}$

b) $\dfrac{x^{a-3}}{5}$
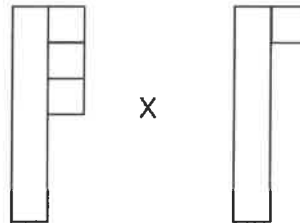
$\dfrac{x^{3(a-3)}}{5^3}$

c) $125x^{3a-9}$

d) $\dfrac{x^{27a}}{5}$

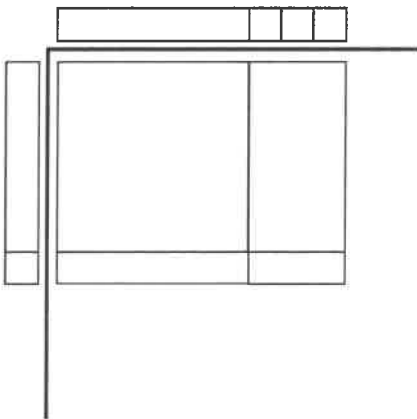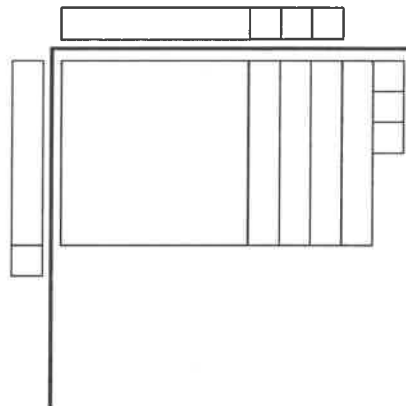32. Which of the following diagrams best represents the expansion of $(x+3)(x+1)$ pictorially?

a)

X

c)

b)

d)

33. Expand and simplify: $(x - 4)^3$

$(x-4)(x^2 - 8x + 16)$

a) $x^3 - 12x^2 + 48x - 64$

$x^3 - 8x^2 + 16x - 4x^2 + 32x - 64$

b) $x^3 + 12x^2 + 48x + 64$

c) $x^3 - 4x^2 + 16x + 64$

d) $x^3 - 64$

34. Katie simplified the expression $(x + b)(x + c)$, where $b < 0$ and $c < 0$, to the form $x^2 + gx + k$. What must be true about g and k?

a) $g < 0$ and $k > 0$

$(x-2)(x-1)$

b) $g < 0$ and $k < 0$

c) $g > 0$ and $k > 0$

$x^2 - 3x + 2$

d) $g > 0$ and $k < 0$

$g < 0 \qquad k > 0$

35. Factor: $y^2 - 81$

a) $(y - 9)^2$

b) $(y + 9)^2$

c) $(y + 9)(y - 9)$

d) $(y + 3)(y - 3)(y + 9)$

36. Which of the following expressions have a factor of $x + 2$?

I.	$x^2 - 4$ $(x+2)(x-2)$
II.	$2x^2 - x - 10$
III.	$5x + 10$ $5(x+2)$

$2x^2 - x - 10 \qquad\qquad -20 \mid -1$

$2x^2 + 4x - 5x - 10 \qquad -5 \quad 4$

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

a) I only

b) III only

c) I and III only

d) I, II and III

37. Given that the area of the rectangle below is $2x^2 + 9x - 5$, determine the length of the rectangle.
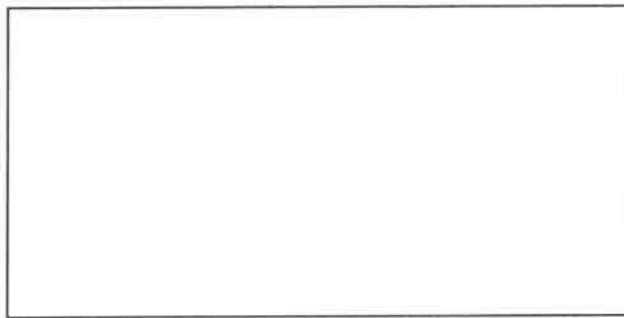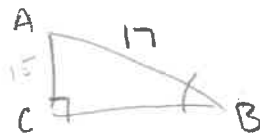
$(2x - 1)(x + 5)$

$2x^2 + 10x - x - 5$

$x + 5$

length

a) $2x - 1$
b) $2x + 1$
c) $2x - 9$
d) $2x^2 + 8x - 10$

38. In $\triangle ABC$, $\angle C = 90°$, AB = 17 cm and AC = 15 cm. Calculate the measure of $\angle ABC$.

a) 28°
b) 41°
c) 49°
d) 62°

A 17

15

C B

$\sin\theta = \dfrac{15}{17}$

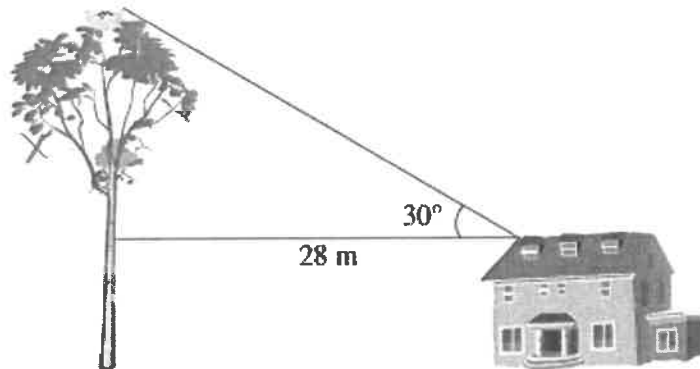$\theta = \sin^{-1}(15 \div 17)$

39. A 10-meter-tall farmhouse is located 28.0 m away from a tree with an eagle's nest. The angle of elevation from the roof of the farmhouse to the eagle's nest is 30°.
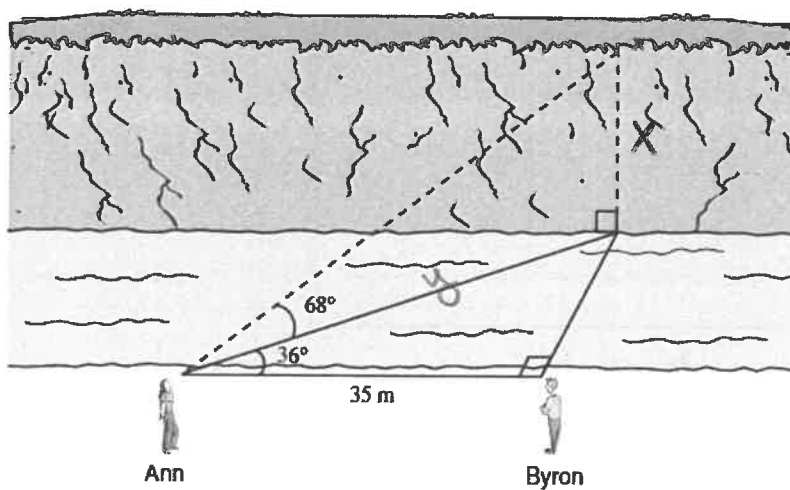
$\tan 30 = \dfrac{x}{28}$

$16.2 = x$
$+ 10$

26.2

30°

28 m

What is the height of the eagle's nest?

a) 16m   b) 24m   c) 26m   d) 48m

40. Ann and Byron positioned themselves 35m apart on one side of a stream. Ann measured the angles, as shown below.

Calculate the height of the cliff on the other side of the stream.

a) 17.5 m
b) 62.9 m
c) 70.1 m
d) 107.1 m
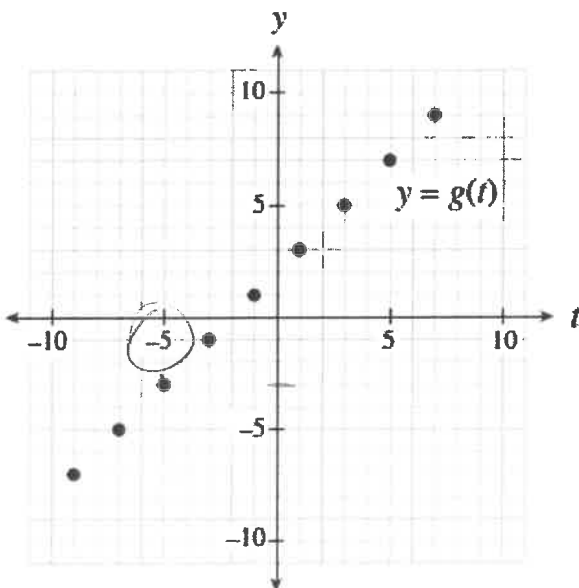
$$\cos 36 = \frac{35}{y}$$

$$y = \frac{35}{\cos 36}$$

$$= 43.26$$

$$\tan 68 = \frac{x}{43.26}$$

$$x = 107.1$$

41. Given the graph of $y = g(t)$ below, determine the value of t for which $g(t) = -3$. Answer as an integer.

$x = -5$

42. Solve for x:

$$3x + 4y = -16$$

$x = (4y)$

$3(4y) + 4y = -16$

$12y + 4y = 16$

$16y = 16$

$y = -1$

$x = 4(-1)$

$\boxed{x = -4}$

43. A package of 12 hex bolts and 10 anchor bolts weighs 7 pounds. A second package of 5 hex bolts and 15 anchor bolts weighs 4 pounds. How much does a single hex bolt weigh? Answer in pounds to one decimal place.

$$12h + 10a = 7$$
$$5h + 15a = 4$$

$$36h + 30a = 21$$
$$-10h - 30a = -8$$
$$26h \qquad = 13$$
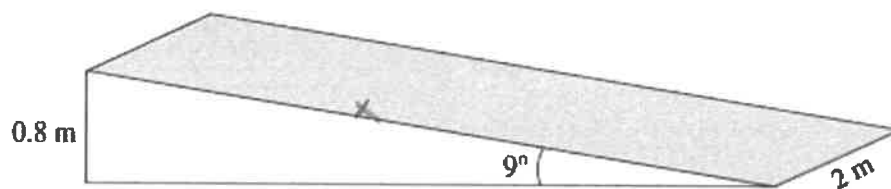$$h \qquad = \frac{1}{2}$$

$$\boxed{h = 0.5}$$

44. How many integer values are there for k for which $4x^2 + kxy - 9y^2$ is factorable?

$$\boxed{9}$$

X - 36	+k
-1 36	
1 -36	
-2 18	
2 -18	
3 -12	
-3 12	
-4 9	
4 -9	
-6 6	

45. A ramp is set up using a rectangular piece of plywood (shaded region) as shown below.

0.8 m

9°

2 m

Calculate the area of the plywood. Answer in square meters to one decimal place.

① $\sin 9 = \dfrac{0.8}{x}$

$x = \dfrac{0.8}{\sin 9}$

$x = 5.1$

② $A = 2.(5.1)$

$$\boxed{= 10.2 m^2}$$