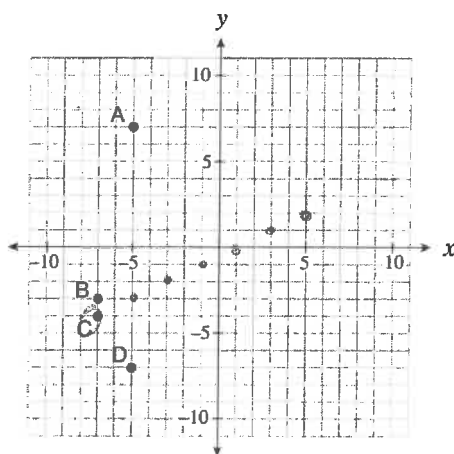**Final Exam Review Part 2**

Use the following graph to answer question 1.
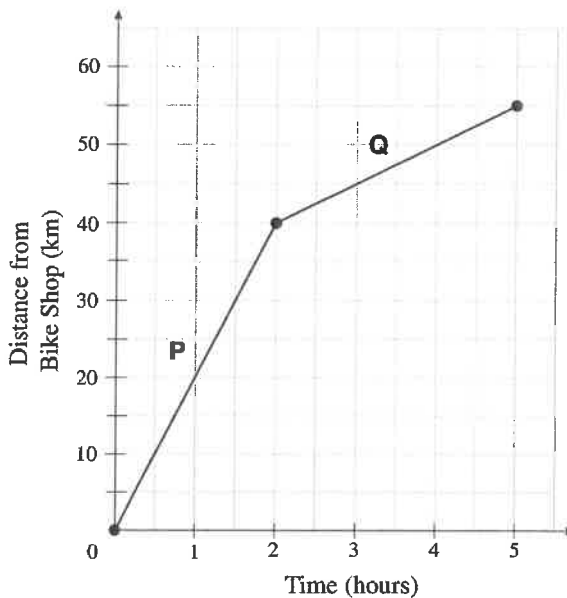

1. The line $y - 2 = \frac{1}{2}(x - 5)$ passes through which point on the graph?

    a) A
    b) B $(5, 2)$
    c) C
    d) D

2. The graph below models a bicycle's distance from a bike shop over time.

P $\frac{40}{2} = 20 \text{ km/h}$

Q $\frac{15}{3} = 5 \text{ km/h}$

Calculate the change in the speed of the bike from segment P to segment Q.
    a) decreased by 15 km/h
    b) decreased by 5 km/h
    c) increased by 15 km/h
    d) increased by 11 km/h

3. Solve the following system of equations:

$$4x + 2y = 8$$

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

$$y = 3x - 1$$

$$4x + 2(3x - 1) = 8$$

$$4x + 6x - 2 = 8$$

$$10x = 10$$

$$x = 1$$

a) (-3, 10)
b) (-1, 6)
c) (1,2)
d) (3,2)

4. Solve the following system of equations:

$$y = 3x + 7$$

$$y = 3x + 4$$

a) No solution
b) One solution
c) An infinite number of solutions
d) Cannot be determined without solving

5. What is the least common multiple of 18 and 24?
   a) 2x3
   b) 2^2x3^3
   c) 2^3x3^2
   d) 2^4x3^3

   3·3·3 2·2·2·3
   (2·3) 2·2·3

6. What is the greatest common factor 12, 24, 30, 72?
   a) 360
   b) 12
   c) 6
   d) 2

   $12 = 2·2·3$
   $24 = 2·2·2·3$
   $30 = 2·3·5$
   $72 = 2·2·2·3·3$

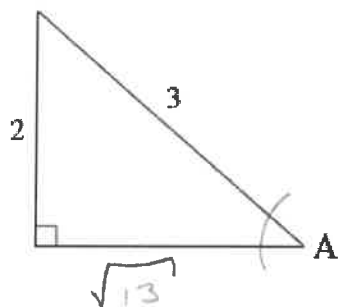7. Simplify: $(2x^3)^3 \cdot 3x^4$
   a) $24x^{36}$
   b) $24x^{13}$
   c) $18x^{36}$
   d) $6x^{13}$

   $2^3 x^9 \cdot 3x^4$

   $2^3 \cdot 3 x^{13}$

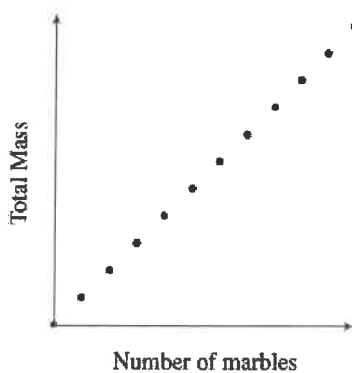8. Determine the ratio of cos A.
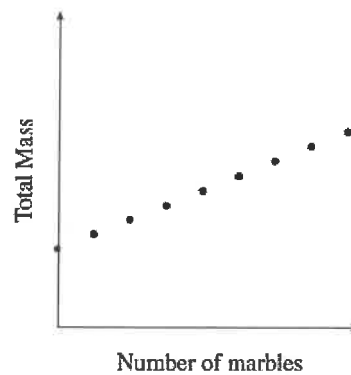
$$a^2 + 2^2 = 3^2$$
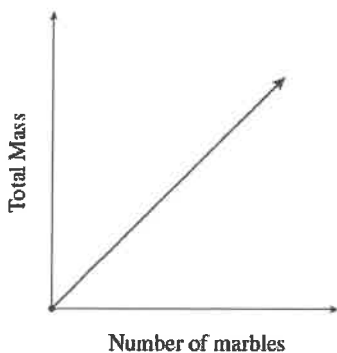$$a^2 + 4 = 9$$
$$a^2 = 5$$
$$a = \sqrt{5}$$

a) $\cos A = \dfrac{2}{3}$

b) $\cos A = \dfrac{\sqrt{5}}{3}$

c) $\cos A = \dfrac{\sqrt{13}}{3}$

d) $\cos A = \dfrac{3}{\sqrt{5}}$

9. Marbles are placed in a jar one at a time. Which graph below best represents the total mass of the jar and marbles as the marbles are added?
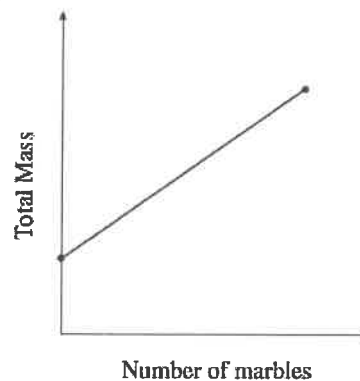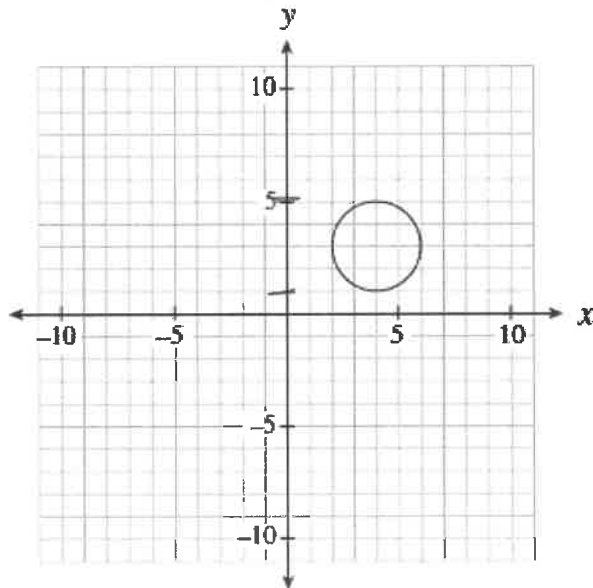
a)

b)

c)

d)

10. What is the range of the graph below?

I.	All x values between 2 and 6 inclusive.
II.	$(2, 6)$
III.	$[1, 5]$
IV.	$1 \le y \le 5$

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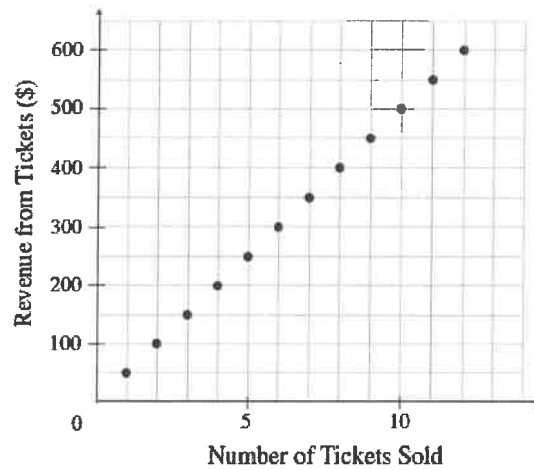c) I and II only
d) III and IV only

11. Which of the following relations are also functions?

I.	$\{(0, 2), (1, 4), (3, 6), (4, 5), (4, 3), (7, -8)\}$ ✗
II.	$y = 2x + 5$ ✓
III.	The output is 6 more than half the input. ✓
IV.	✓

$y = \frac{1}{2}x + 6$.
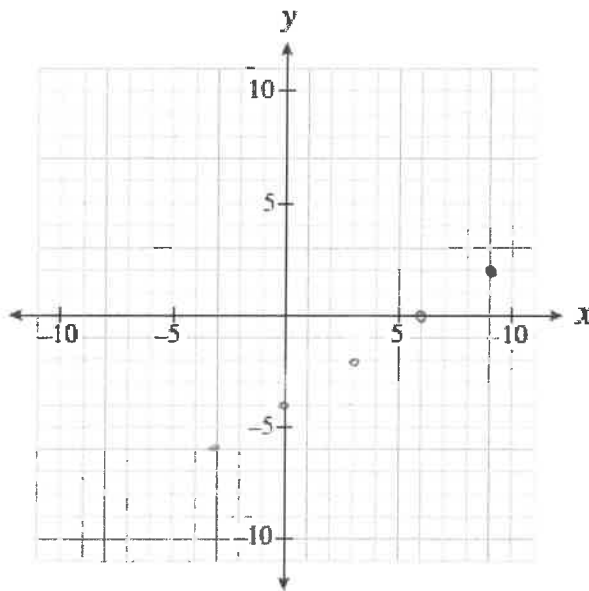
a) I only
b) I and IV only
c) II and III only
d) II, III and IV only

12. What does the slope represent in the graph below?

a) Price per ticket
b) Profit from tickets
c) Revenue from tickets
d) Number of tickets sold

The grid below may be used for rough work to answer question 13.

13. A line has a slope of $\frac{2}{3}$ and passes through the point (6,0). Which of the following points must also be on the line?

a) (-3, -6)
b) (3,8)
c) (4,-3)
d) (9,3)

14. A video game programmer needs to simulate a shot on a gaming screen. The shot needs to have a slope of $\frac{6}{5}$ to a target at (100, 250). If the shooter has a horizontal position of 65, what would be the shooter's position on the screen?

$$\frac{y_2 - y_1}{x_2 - x_1}$$

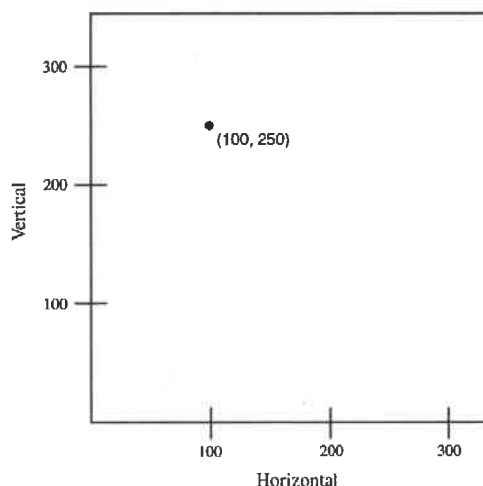$$\frac{6}{5} = \frac{250 - y}{100 - 65}$$

$6(35) = 5(250 - y)$

$210 = 1250 - 5y$

$-1250 =$

$-1040 = -5y$

Video Screen

a) (65, 78)
b) (65, 125)
c) (65, 208)
d) (65, 220.8)

15. Which of the following scenarios is **not** linear?
a) the height of a football thrown over time
b) the total weight of a jar of pennies as more pennies are added
c) the distance travelled by a car moving at a constant speed over time
d) the pay of a truck driver who earns $2500 a month, plus %0.50 for every kilometre he drives

?

Use the following graph to answer question 16.

Amount of Gasoline Remaining vs. Distance Driven
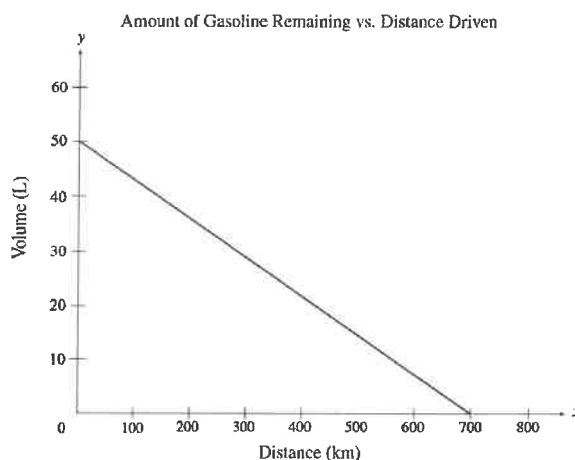
16. The graph above shows the relationship between the amount of gasoline remaining in a 50 L tank and the distance driven for a certain car.

What does the x-intercept represent in this situation?

a) Fuel capacity of the gasoline tank
b) Total distance travelled during a long trip
c) Total distance driven until the car is out of gas
d) Number of kilometres driven per litre of gasoline

17. Damien has a list of 37 potential customers for his house-painting business. In order to get a business grant, he must graph his income versus the number of customers. Determine the domain of the graph.
a) {0,1,2,3,...}
b) {0,1,2,3,...37}
c) All real numbers
d) All real numbers between 0 and 37

18. Rewrite $y = \frac{x}{5} - 6$ in general form.
a) $\frac{x}{5} - y - 6 = 0$
b) $x + 5y - 6 = 0$
c) $x - 5y - 30 = 0$
d) $5x - 5y - 30 = 0$

19. Given the equation $Ax + By + C = 0$, which of the following conditions must be true for the graph of the line to have a positive slope and a positive y-intercept?
a) $A > 0, B > 0, C > 0$
b) $A > 0, B < 0, C > 0$
c) $A > 0, B > 0, C < 0$
d) $A > 0, B < 0, C < 0$

$y = 2x + 5$

$0 = 2x - y + 5$

$A > 0$
$B < 0$
$C > 0$

20. Which of the following lines have a negative slope?

✗	I.	$y+3=0$
	(II.)	$2x+y=6$
	(III.)	$(y+2)=-4(x-5)$

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

21. Which of the following statements are true for $2x + 3y = 6$?

I.	The y-intercept is -2. ✗
II.	The line is parallel to $y = 2x$. ✗
III.	The slope-intercept form of the line is $y = \frac{2}{3}x + 2$. ✗
IV.	The range is all real numbers. ✓

a) IV only
b) I and II only
c) I and IV only
d) III and IV only
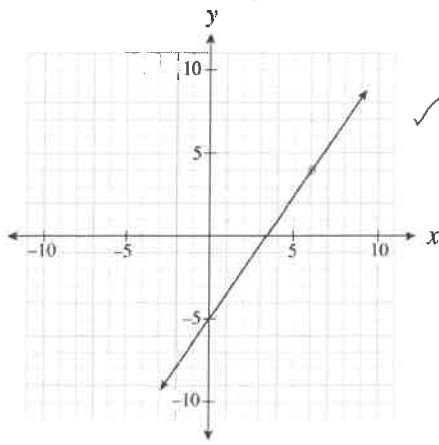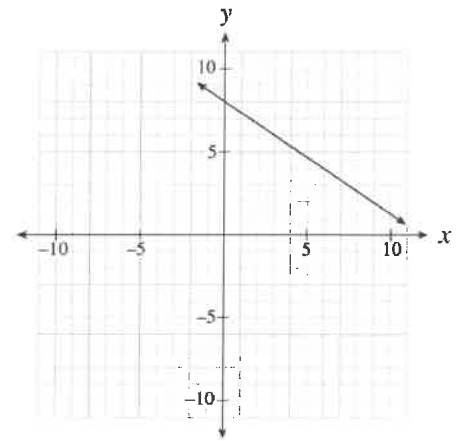
$2x + 3y = 6$

$3y = -2x + 6$

$y = -\frac{2}{3}x + 2$
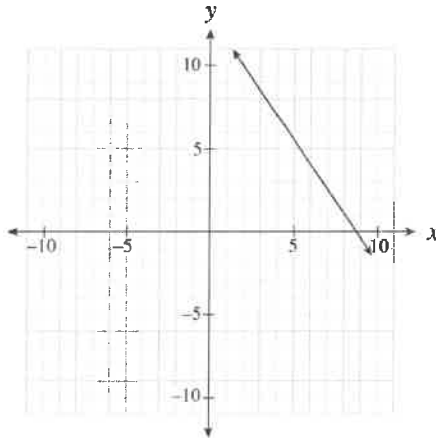
$$y - 4 = \frac{3}{2}(x - 6)$$

22. Which of the following graphs represents a line that passes through (6, 4) and is perpendicular to $y = -\frac{2}{3}x$? $\quad m_\perp = \frac{3}{2}$
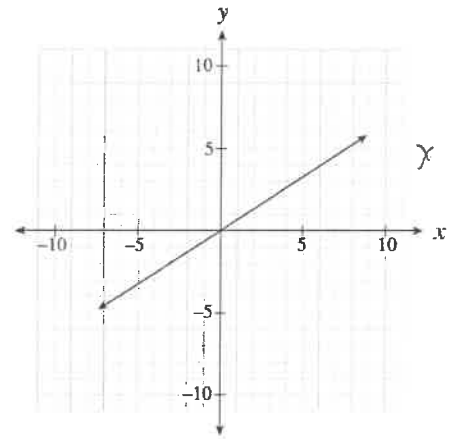
a) ✓

c)

b)

d)

23. Determine the slope-intercept form of the line that passes through the point (-4,3) and is parallel to the line segment that joins A(-1, -5) and B(-3, 1).

a) $y = -3x - 9$

b) $y = -3x + 5$

c) $y = -3x + 15$

d) $y = 3x + 15$

$$m = \frac{1 - -5}{-3 - -1}$$

$$= \frac{6}{-2}$$

$$= -3$$

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

$$3 = 12 + b$$

$$-9 = b$$

24. A hot-dog stand owner makes a profit of $100 when he sells 90 hot dogs a day. He has a loss of $30 when he sells 25 hot dogs a day. Which linear relation represents his profit?

 a) $y = 0.5x + 55$

 b) $y = 1.08x + 3.08$

 c) $y = 1.11x$

 d) $y = 2x - 80$

25. Which ordered pair represents $f(3) = -5$?
 a) (-5, 3)
 b) (-3, 5)
 c) (3, -5)
 d) (5, -3)

26. In which quadrant do the graphs of $x = -7$ and $y = 2x + 1$ intersect?
 a) Quadrant I
 b) Quadrant II
 c) Quadrant III
 d) Quadrant IV

27. Joey bough 8 books. Some books cost $12 each the rest cost $18 each. He spent a total of $108. Which of the following systems of linear equations could represent the given situation?
 a) $x + y = 8$
    $12x + 18y = 108$
 b) $x + y = 108$
    $12x + 18y = 8$
 c) $x + 12y = 8$

    $x + 18y = 108$

 d) $12x + y = 8$

    $x + 18y = 108$

28. Simplify: $(3a^2)^3(4a^3)^0$ 3^3a^6
       a) $9a^6$
       b) $27a^6$
       c) $36a^8$
       d) $108a^9$

29. Expand and simplify: $(4x - 3)^2$
 a) $16x^2 + 9$
 b) $16x^2 - 12x + 9$
 c) $16x^2 - 24x - 9$
 d) $16x^2 - 24x + 9$

spacing.

30. Pam expanded and simplified $(x-3)(x^2+2x-4)$, as shown below.

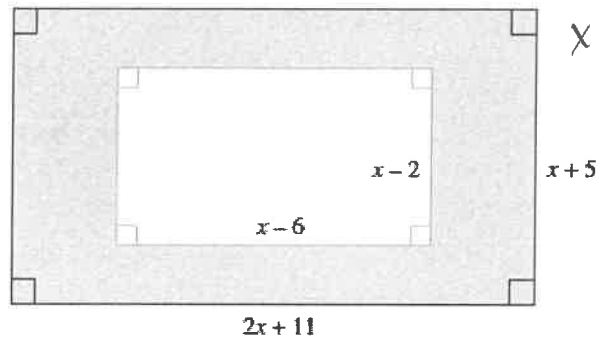|	Steps
I.	$x(x^2+2x-4)-3(x^2+2x-4)$
II.	$x^3+2x^2-4x-3x^2+6x-12$
III.	$x^3-x^2+2x-12$

In which step is Pam's first error?
a) Step I
b) Step II
c) Step III
d) There is no mistake

sprd

$(2x+11)(x+5)-(x-6)(x-2)$

$2x^2+10x+11x+55-(x^2-8x+12)$

31. Determine an expression to represent the shaded area below.

$x^2+29x+43$

$x-2$

$x+5$

$x-6$

$2x+11$

a) x^2+43
b) $x^2+13x+67$
c) $x^2+29x+43$
d) $3x^2+13x+67$

32. Determine the greatest common factor of $12x^5y$, $4x^3y^2$ and $6x^2y^4$.
a) $2xy$
b) $2x^2y$
c) $4x^3y^2$
d) $12x^5y^4$

spacing

33. Which of the following expressions is a factor of $x^2-8x-20$?
a) $x-2$
b) $x-4$
c) $x-5$
d) $x-10$

$(x-10)(x+2)$

34. When completely factored, how many factors does $2x^4-24x^2-128$ have?
a) 2
b) 3
c) 4
d) 5
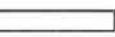
$2(x^4-12x-64)$

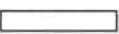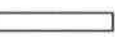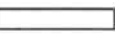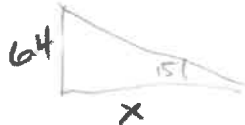$2(x^2-16)(x^2+4)$

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

omit

~~35.~~ Joe was asked to factor $6x^2 + x - 15$ and represent it with math tiles. What additional tiles would he need to represent the total area of the two factors?

a) 8 each of [   ] and [   ]

b) 9 each of [   ] and [   ]

c) 10 each of [   ] and [   ]

d) 11 each of [   ] and [   ]

spacing
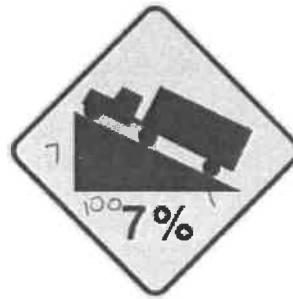
36. The angle of elevation of the sun is 15°. How long is the shadow of a 64 m tall building?

a) 17 m
b) 66 m
c) 239 m
d) 247 m

$\tan 15 = \dfrac{64}{x}$

37. As Tracey is driving, she sees a sign telling her the road has a 7% grade (i.e., a rise of 7 metres for a horizontal change of 100 m). Which of the following expressions will calculate the angle between the road and the horizontal?
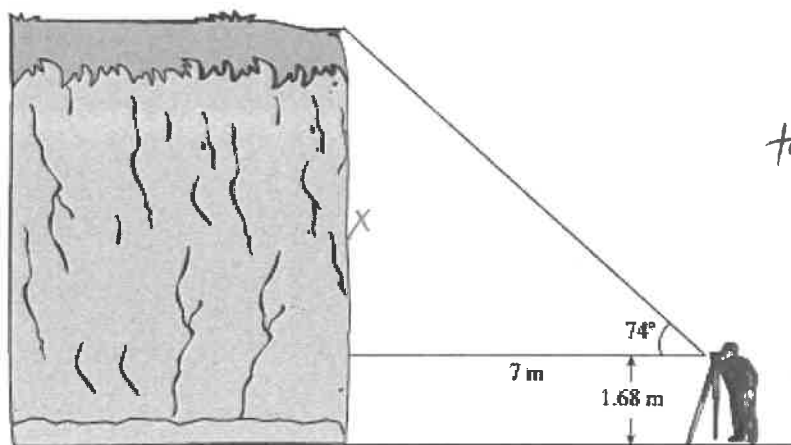

a) $\tan\left(\dfrac{7}{100}\right)$

b) $\sin\left(\dfrac{7}{100}\right)$

c) $\tan^{-1}\left(\dfrac{7}{100}\right)$

d) $\sin^{-1}\left(\dfrac{7}{100}\right)$

$\tan\theta = \dfrac{1}{100}$

$\theta = \tan^{-1}(7 \div 100)$

38. Mission's outdoor club collected the following data to determine the height of a cliff.

$tan74 = \dfrac{x}{7}$

$x =$

$+ 1.68$

Calculate the height of the cliff.
a) 3.7 m
b) 8.4 m
c) 24.4 m
d) 26.1 m

39. A waterslide descends 20 m over a horizontal distance of 50 m. What is the slope of the waterslide? Answer with a positive value, to the nearest tenth.

0.4

20

50

40. The slope of AB is $-\dfrac{2}{3}$. The slope of CD is $\dfrac{w}{24}$. Given $AB\|CD$, determine the value of w. Answer as an integer.

$$-\dfrac{2}{3} = \dfrac{w}{24}$$

×8

×8

$w = \boxed{-16}$

41. The cost C, in dollars, to rent a car is determined by the formula $C(k) = 0.15k + 22$, where k is the number of kilometers driven. Calculate the value of k if $C(k) = 166$. Answer to the nearest kilometer.

$166 = 0.15k + 22$
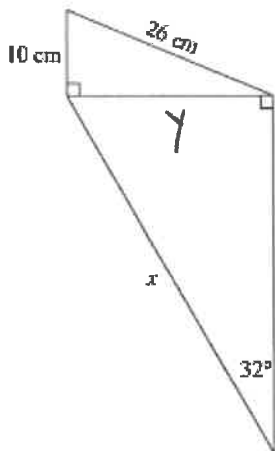
$144 = 0.15k$

$\boxed{960\,km = k}$

42. A bacteria culture doubles every hour. If there are 10 000 bacteria now, how many bacteria were there 4 hours ago? Answer to the nearest bacterium.

$= 10000(2)^{-4}$

$= \dfrac{10000}{2^4}$

$= \dfrac{10000}{16} \rightarrow \boxed{625}$

43. Calculate the length of side x on the diagram below. Answer to the nearest centimeter.

10 cm
26 cm
Y
x
32°

$26^2 - 10^2 = y^2$

$676 - 100 = y^2$

$576 = y^2$

$24 = y$

$\sin 32 = \dfrac{24}{x}$

$x = \dfrac{24}{\sin 32}$

$\boxed{x = 45\,cm}$