

Mathletics

Holiday Review – Year Eight

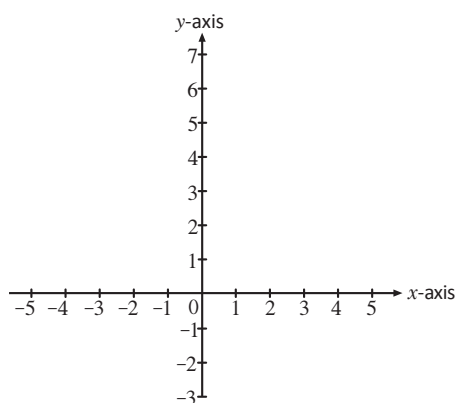
Linear Relationships:

Sketch each of these linear equations using the y -intercept and gradient

a $y = 2x + 3$

Gradient (m) =

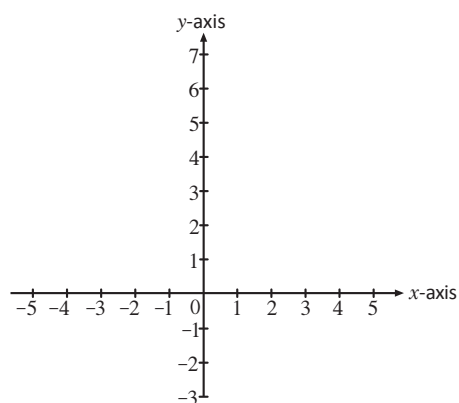
y -intercept (b) =



b $y = -3x + 1$

Gradient (m) =

y -intercept (b) =



Simplifying Algebra:



Power rule for powers

Simplify:

a $(j^2)^5$

b $(b^3)^3$

c $(r^4)^{0.5}$

d $(x^{-2})^{-4}$

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Percentage Calculations:

Four different 22.5 gram pieces of lead were studied and found to contain 15.3, 13.05, 18.225 and 16.825 grams of graphite. Calculate the percentage of graphite found in each lead and then use the table below to determine what pencil type each lead was from.

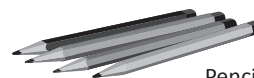
Pencil Type	Graphite	Clay, Wax, etc.
6H	50%	50%
5H	53%	47%
4H	55%	45%
3H	58%	42%
2H	61%	39%
H	63%	37%
HB	68%	32%
2B	73%	27%
3B	75%	25%
4B	78%	22%
5B	81%	19%
6B	84%	16%

a 15.3 grams of graphite

b 13.05 grams of graphite

c 18.225 grams of graphite

d 16.825 grams of graphite



Pencil type

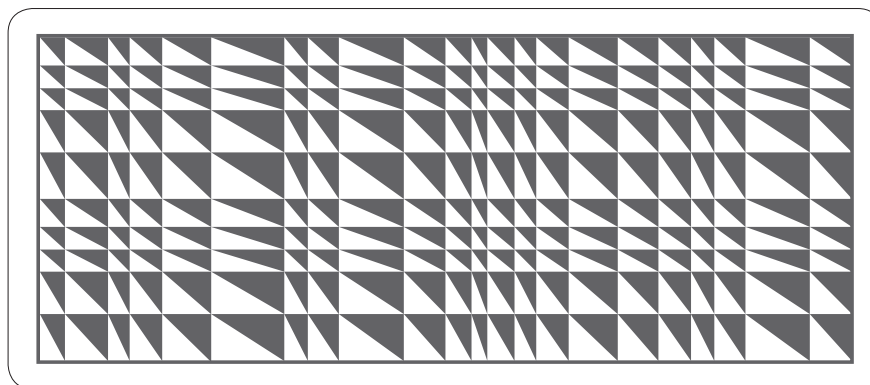
Pencil type

Pencil type

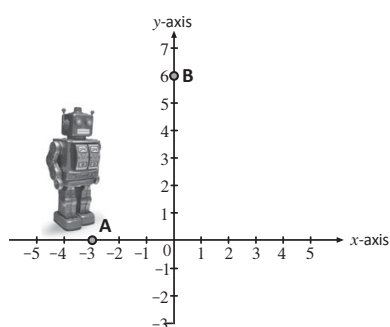
Pencil type

Straight Lines:

This curvy optical illusion is made using lots of lines that have different slopes.



- a The robot standing on the x -axis at point A needs to get to point B on the y -axis. The solar panels only have enough stored energy to travel the shortest straight line path. Write down the rule of the line the robot needs to follow to get from A to B.



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Rates and Ratios:

Which are the best buys?

- a** 4 kg of fish for \$24.00 or
8 kg of fish for \$50?

[Hint: Multiply the first one by 2.]

- b** 3 sacks of potatoes for \$14 or
4 sacks of potatoes for \$17?

[Hint: Multiply the first one by 4 and the second one by 3 to find what 12 sacks cost in each case.]

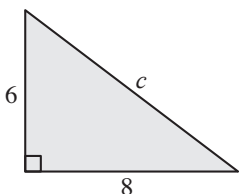
- c** 5 sets of guitar strings for \$78.75 or
7 sets of guitar strings for \$110.95?

- d** 8 loaves of sourdough bread for \$41.60 or
25 loaves of sourdough bread for \$131.25?

Pythagoras' Theorem:

Complete these Pythagoras' Theorem calculations to find the length of the hypotenuse in each triangle.

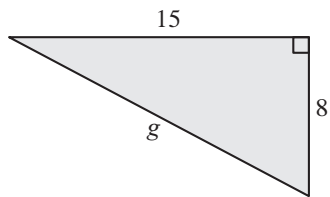
a


$$c^2 = 6^2 + \boxed{}^2$$
$$\therefore c^2 = \boxed{} + \boxed{}$$
$$\therefore c^2 = \boxed{}$$

exact form $\rightarrow \therefore c = \sqrt{\boxed{}}$

$$\therefore c = \boxed{} \text{ units}$$

b


$$g^2 = 8^2 + \boxed{}^2$$
$$\therefore g^2 = \boxed{} + \boxed{}$$
$$\therefore g^2 = \boxed{}$$

exact form $\rightarrow \therefore g = \sqrt{\boxed{}}$

$$\therefore g = \boxed{} \text{ units}$$