

Topic Check In - 6.02 Algebraic formulae

1. Find the value of $m + 2(n - 3)$ when $m = 4$ and $n = 5$.
2. Rearrange $v = u + at$ to make u the subject.
3. Find the circumference of a circle with diameter 6 cm, correct to the nearest whole number.
4. Given $v^2 = u^2 + 2as$, find v when $u = 10$, $a = 2$ and $s = 75$.
5. Given $F = \frac{9}{5}C + 32$, find C when $F = 77$.
6. For the following question you may use the formula $v = u + at$ where:

v = final speed u = initial speed
 a = acceleration t = time

A car accelerates uniformly with acceleration 2 m/s^2 . If the initial speed is 20 m/s and the final speed is 50 m/s , show that it takes 15 seconds to reach the final speed.

7. For the following question you may use the formula $v^2 = u^2 + 2as$ where:

v = final speed u = initial speed
 a = acceleration s = distance travelled

A train is travelling at a speed of 40 m/s . When the driver applies the brakes, the train decelerates at 2 m/s^2 . Show that the driver needs to start applying the brakes when he is 400 m from the station.

8. Mary is given the question 'Find the value of $a + b \times c$ when $a = 2$, $b = 3$ and $c = 4$.' She says that " $a + b = 5$, then multiply by c gives an answer of 20". Explain why she is incorrect.
9. Kyle wishes to construct a circular patio in his garden which is to be at least 30 m^2 . Find the minimum radius of the circle in whole metres.

10. For the following question you may use the formula $s = ut + \frac{1}{2}at^2$ where:

t = time u = initial speed
 a = acceleration s = distance travelled

A car is stopped at a traffic light. As the light goes green, a cyclist passes the car at 8 m/s . The car immediately accelerates at 4 m/s^2 . How far ahead of the cyclist is the car after 5 seconds have passed?

Extension

Jake is 12 years older than his dog. Next year he will be four times as old as his dog will be. How old is Jake now?



GCSE (9–1) MATHEMATICS

Answers

1. 8
2. $u = v - at$
3. 19 cm
4. 20
5. 25°C
6. $(50 - 20)/2 = 15$ seconds
7. Substitute to give total distance = 400 m or substitute $s = 400$ and show that $v^2 = 0$.
8. Mary should multiply before adding, so the answer should be $2 + 3 \times 4 = 2 + 12 = 14$.
9. 4 m
10. 10 m

Extension

Jake is 15 years old (and the dog is 3 years old).



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Assessment Objective	Qu.	Topic	R	A	G
AO1	1	Substitute values into an expression.			
AO1	2	Change the subject of a formula.			
AO1	3	Recall and use standard formula for circumference of a circle.			
AO1	4	Substitute into a kinematics formula.			
AO1	5	Substitute into and rearrange a formula.			
AO2	6	Show that a worded kinematic problem can be solved by rearranging.			
AO2	7	Show that a worded kinematic problem can be solved by rearranging and using BIDMAS.			
AO2	8	Correctly use BIDMAS in substitution.			
AO3	9	Recall and use standard formula for area of a circle, rounding appropriately.			
AO3	10	Solve a kinematics problem.			

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