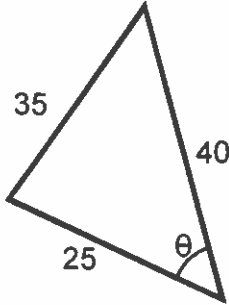

Answer Key - Sampler B

1. D
 2. B
 3. C
 4. A
 5. C
 6. D
 7. D
 8. B
 9. C
 10. A
 11. D
 12. A
 13. B
 14. C
 15. B
-

- 16) Find θ . Round the answer to the nearest degree.



$$\cos \theta = \frac{35^2 - 40^2 - 25^2}{-2(40)(25)}$$

$$\cos \theta = \frac{1225 - 1600 - 625}{-2000}$$

$$\cos \theta = \frac{-1000}{-2000}$$

$$\cos \theta = 0.5$$

$$\theta = \cos^{-1}(0.5)$$

$$\theta = 60^\circ$$

Answer: 60 °

16.

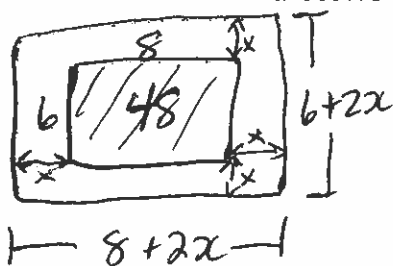
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Value of 1

- 17) Use a quadratic function to model and solve the given problem:

A landscaper is designing a 6 m by 8 m rectangular garden that will then be surrounded by a uniform border of crushed stone. She has enough crushed stone to cover 72 m². What is the width of the border if she uses all of the crushed stone?



$$\text{Total area} = 48 + 72 = 120$$

$$(8 + 2x)(6 + 2x) = 120$$

$$48 + 16x + 12x + 4x^2 = 120$$

$$4x^2 + 28x + 48 - 120 = 0$$

$$4x^2 + 28x - 72 = 0$$

$$4(x^2 + 7x - 18) = 0$$

$$4(x + 9)(x - 2) = 0$$

$$x = -9 \text{ or } x = 2$$

Can't have negative length

Answer:

\therefore If all the crushed stone is used, the border will be 2 m wide.

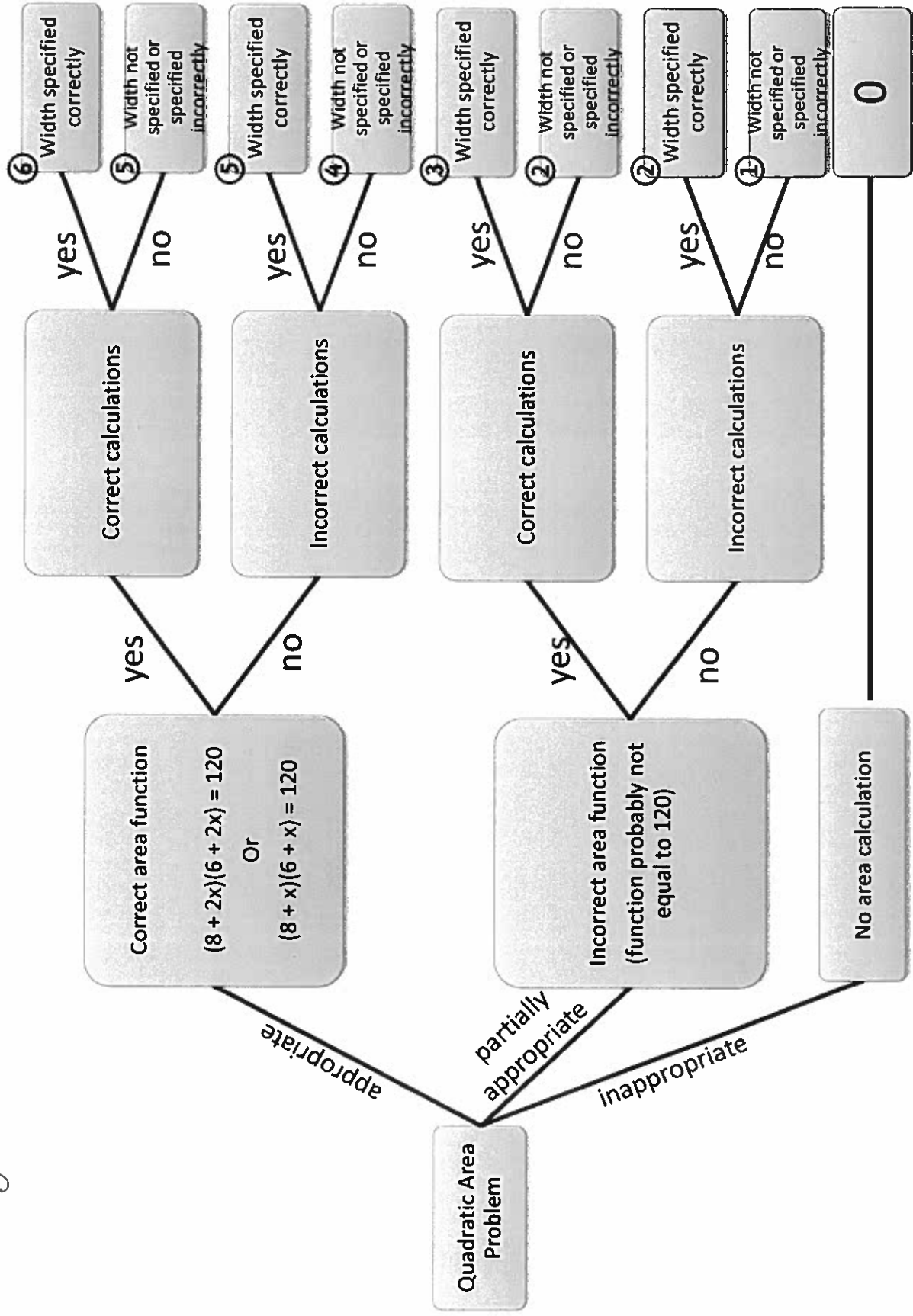
17.

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Value of 3

Marking Rubric



If a solution is correct but not completed, it is considered to be only partially appropriate.

- 18) Solve and identify all non-permissible values.

$$\frac{9x-3}{x^2-x-6} - \frac{6}{x-3} = 2$$

$$\begin{array}{l} x \neq 3 \\ x \neq -2 \end{array}$$

$$\frac{9x-3}{(x-3)(x+2)} - \frac{6}{x-3} = 2$$

$$9x-3 - 6(x+2) = 2(x-3)(x+2)$$

$$9x-3-6x-12 = 2(x^2-x-6)$$

$$3x-15 = 2x^2-2x-12$$

$$-2x^2+5x-3=0$$

$$2x^2-5x+3=0$$

$$2x^2-2x-3x+3=0$$

$$2x(x-1)-3(x-1)=0$$

$$(x-1)(2x-3)=0$$

$$x=1 \text{ or } x=\frac{3}{2}$$

Answer:

$$\therefore x=1 \text{ or } x=\frac{3}{2}$$

$$x \neq 3$$

$$x \neq -2$$

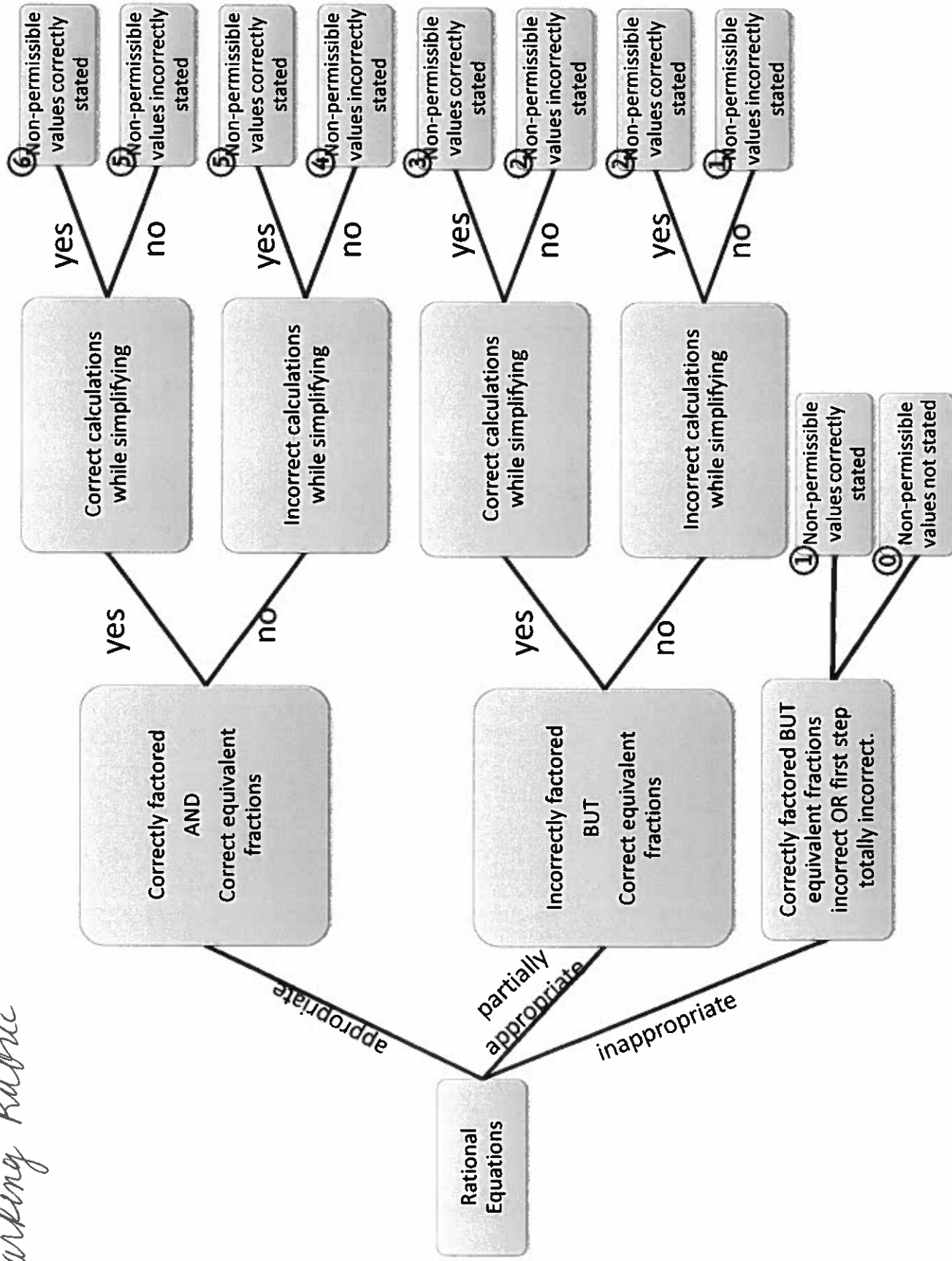
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Value of 3

Marking Rubric



If a solution is correct but not completed, it is considered to be only partially appropriate.

19) Solve: $|x^2 + 5x| = 2x$

$$x^2 + 5x = 2x$$

$$x^2 + 5x - 2x = 0$$

$$x^2 + 3x = 0$$

$$x(x+3) = 0$$

$$\boxed{x=0} \text{ or } x = \cancel{3}$$

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

$$-x^2 - 5x = 2x$$

$$-x^2 - 5x - 2x = 0$$

$$-x^2 - 7x = 0$$

$$-x(x+7) = 0$$

$$\boxed{x=0} \text{ or } x = \cancel{-7}$$

check:

$$|0^2 + 5(0)|$$

$$|0| = 2(0)$$

$$0 = 0$$

$$|(-3)^2 + 5(-3)|$$

$$|9 - 15|$$

$$|-6| \quad 2(-3)$$

$$6 \neq -6$$

$$|(-7)^2 + 5(-7)|$$

$$|49 - 35|$$

$$|14| \quad 2(-7)$$

$$14 \neq -14$$

Answer:

$$\therefore x = 0$$

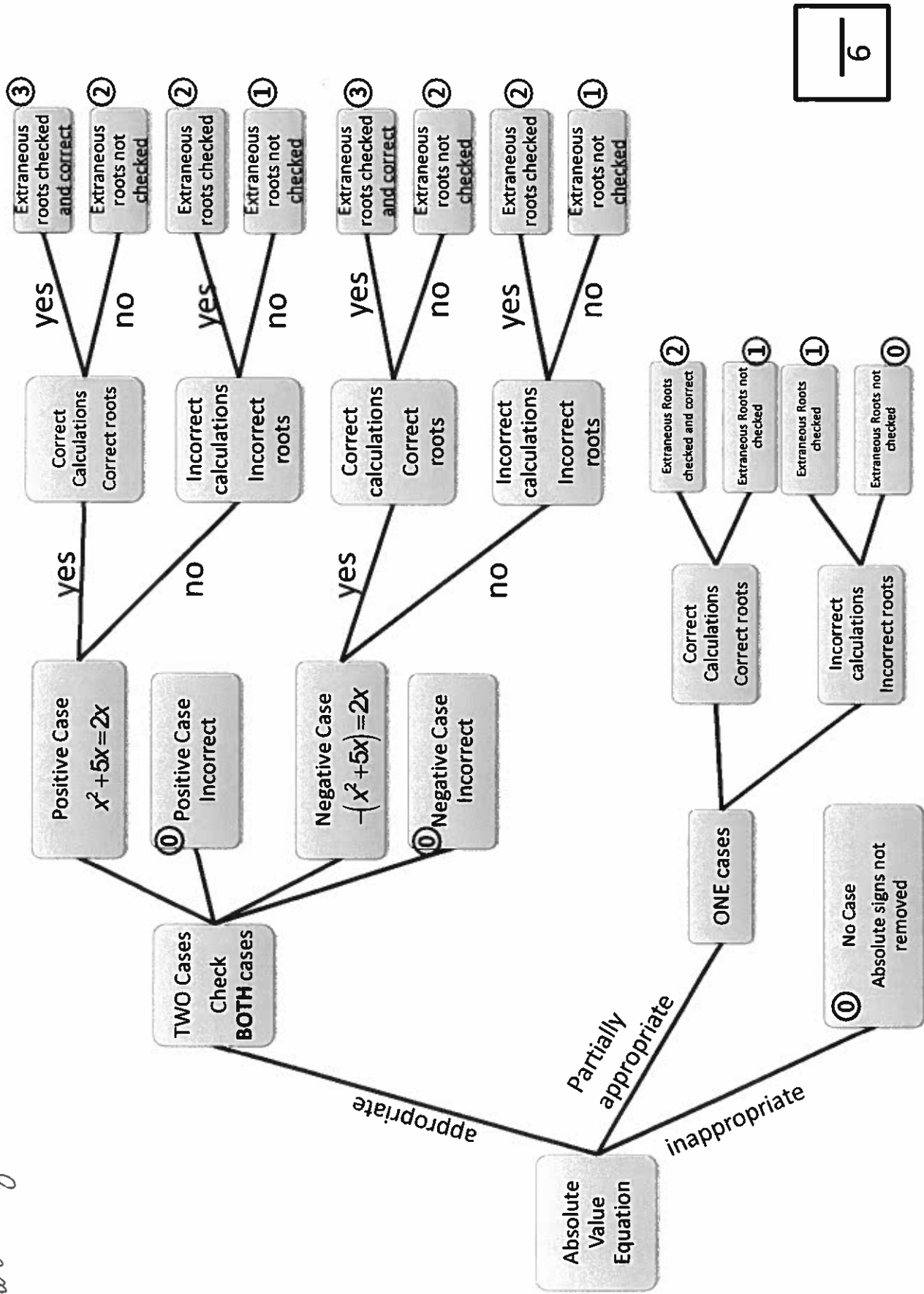
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Value of 3

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6

If a solution is correct but not completed, it is considered to be only partially appropriate.

- 20) The monthly production of crude oil, in barrels, for the first four months for a test well at Hebron is given below. In theory, what is the expected lifetime production of the well, to the nearest barrel?

Month	# of Barrels
1	40 000
2	34 000
3	28 900
4	24 565

$$t_1 = 40\,000$$

$$r = \frac{34\,000}{40\,000} = 0.85$$

$$\begin{aligned} S_{\infty} &= \frac{40\,000}{1-0.85} \\ &= \frac{40\,000}{0.15} \\ &= 266\,667 \end{aligned}$$

Answer:

\therefore The expected lifetime production of the well is 266 667 barrels.

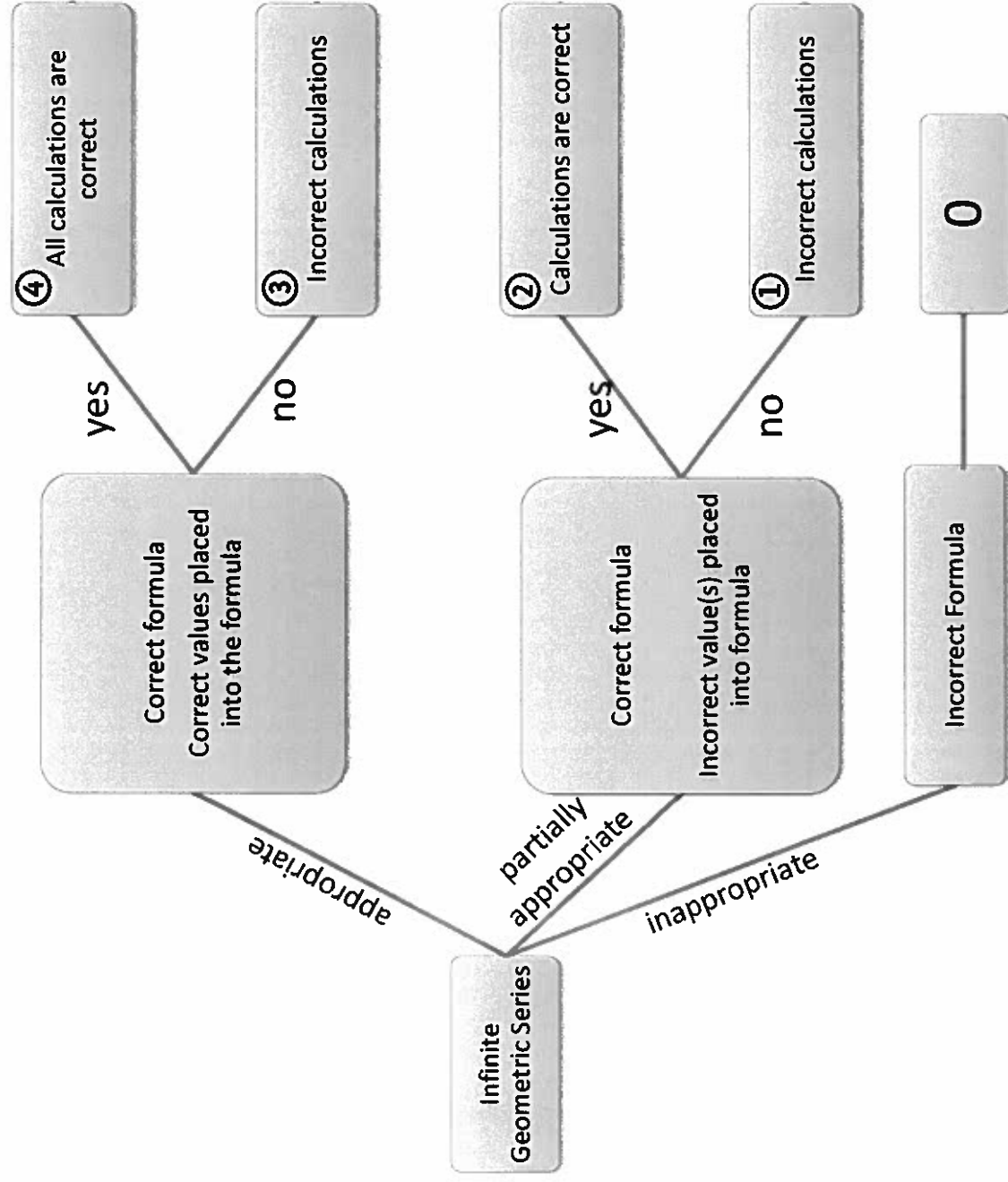
20.

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Value of 2

Marking Rubric



If a solution is correct but not completed, it is considered to be only partially appropriate.