

2023



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# AP<sup>®</sup> Calculus BC

## Free-Response Questions

Answer QUESTION 1 parts (a) and (b) on this page.

$t$ (seconds)	0	60	90	120	135	150
$f(t)$ (gallons per second)	0	0.1	0.15	0.1	0.05	0

Response for question 1(a)

Response for question 1(b)

Use a pencil or a pen with black or dark blue ink. Do NOT write your name. Do NOT write outside the box.

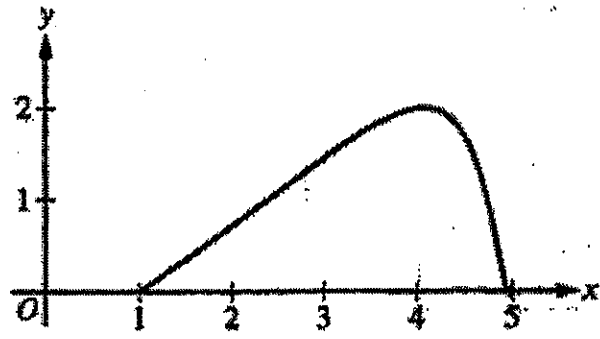
Answer QUESTION 1 parts (c) and (d) on this page.

Response for question 1(c)

Response for question 1(d)



Answer QUESTION 2 parts (a) and (b) on this page.



Response for question 2(a)

Response for question 2(b)

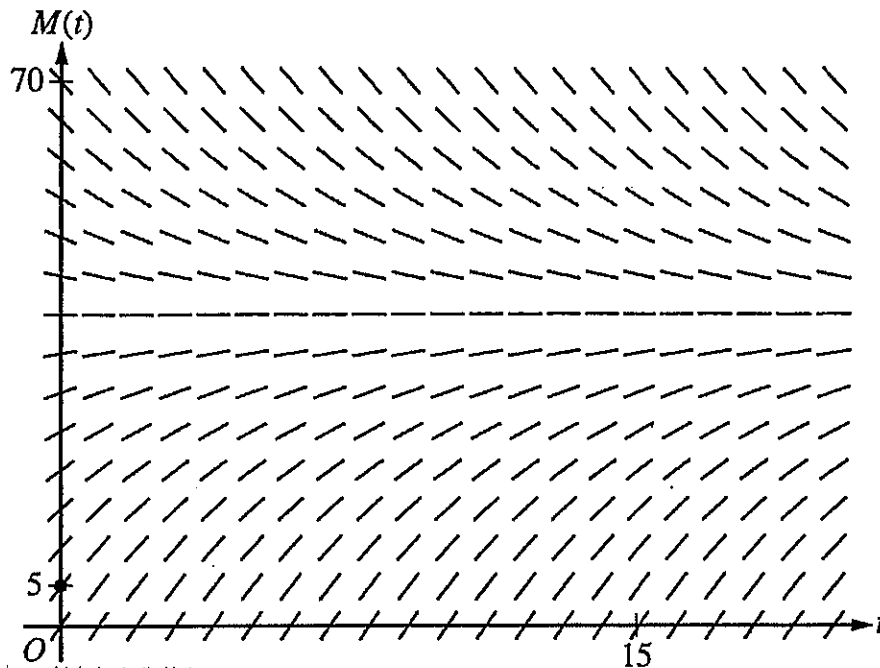
Answer QUESTION 2 parts (c) and (d) on this page.

Response for question 2(c)

Response for question 2(d)

Answer QUESTION 3 parts (a) and (b) on this page.

Response for question 3(a)



Response for question 3(b)

Use a pencil or a pen with black or dark blue ink. Do NOT write your name. Do NOT write outside the box.

3

3

**NO CALCULATOR ALLOWED**

3

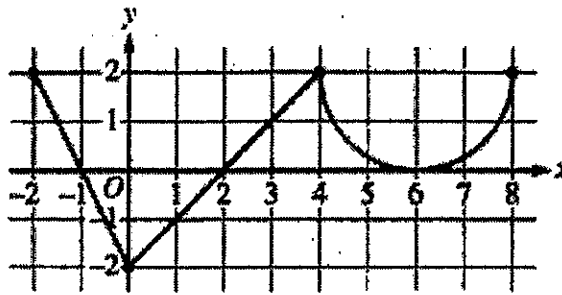
3

**Answer QUESTION 3 parts (c) and (d) on this page.**

Response for question 3(c)

Response for question 3(d)

Answer QUESTION 4 parts (a) and (b) on this page.



Graph of  $f'$

Response for question 4(a)

Response for question 4(b)



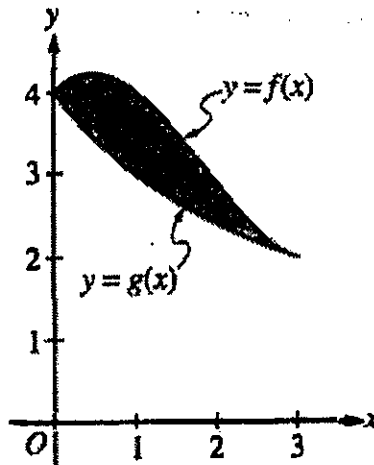


Answer QUESTION 4 parts (c) and (d) on this page.

Response for question 4(c)

Response for question 4(d)

Answer QUESTION 5 part (a) on this page.



Response for question 5(a)

5

5

**NO CALCULATOR ALLOWED**

5

5

**Answer QUESTION 5 parts (b) and (c) on this page.**

Response for question 5(b)

Response for question 5(c)

Answer QUESTION 6 parts (a) and (b) on this page.

Response for question 6(a)

Response for question 6(b)

Answer QUESTION 6 part (c) on this page.

Response for question 6(c)

