
TAKE HOME QUIZ 2 – DUE ON MONDAY 14 MARCH. – ABSOLUTELY NO EXCEPTION!

1 A water trough is 15 m long and a cross – section has the shape of an isosceles trapezoid that is 35 cm wide at the bottom, 85 cm wide at the top, and has height 60 cm. If the trough is being filled with water at the rate of $0.8 \text{ m}^3/\text{min}$, how fast is the water level rising when the water is 45 cm deep? Round the result to the nearest hundredth.

- a. 7.46 cm/min
- b. 7.41 cm/min
- c. 17.46 cm/min
- d. 7.16 cm/min
- e. 6.29 cm/min
- f. 7.36 cm/min

2 A man starts walking north at 3 ft/s from a point P. Five minutes later, a woman starts walking south at 6 ft/s from a point 500 ft due east of P. At what rate are the people moving apart 25 min after the woman starts walking? Round the result to the nearest hundredth.

- a. 10 ft/s
- b. 6.99 ft/s
- c. 9.09 ft/s
- d. 8.99 ft/s
- e. 9.02 ft/s
- f. 8.98 ft/s

3 Find the absolute maximum of the function

$$f(x) = \sin 10x + \cos 10x$$

on the interval $\left[0, \frac{\pi}{30}\right]$.

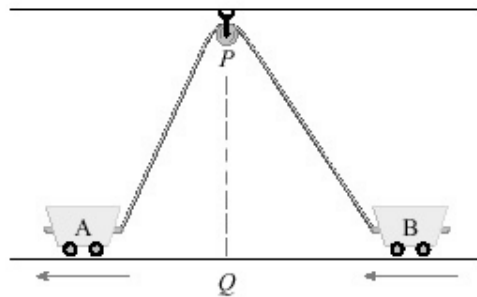
4 Find the critical numbers of the function.

$$F(x) = x^{\frac{4}{5}}(x - 2)^2$$

5 A plane flying with a constant speed of 300 km/h passes over a ground radar station at an altitude of 2 km and climbs at an angle of 30° . At what rate is the distance from the plane to the radar station increasing a minute later? Round the result to the nearest integer if necessary.

- a. 286 km/h
- b. 288 km/h
- c. 299 km/h
- d. 287 km/h
- e. 290 km/h
- f. 289 km/h

6 Two carts, A and B, are connected by a rope 37 ft long that passes over a pulley (see the figure below). The point Q is on the floor 13 ft directly beneath and between the carts. Cart A is being pulled away from Q at a speed of 5 ft/s. How fast is cart B moving toward Q at the instant when cart A is 3 ft from Q? Round the result to the nearest hundredth.



- a. 1.28 ft/s
- b. 1.85 ft/s
- c. 1.36 ft/s
- d. 1.15 ft/s
- e. 1.35 ft/s
- f. 2.36 ft/s

7 Find the absolute minimum value of

$$y = 6x^2 + \frac{12}{x}$$

on the interval $\left[\frac{1}{2}, 12\right]$.

ANSWER KEY

takehome2 – Answers For A

1. f

2. d

3. $\sqrt{2}$
 $f=\sqrt{2}$

4. $2, \frac{4}{7}, 0$

5. b

6. e

$y(1)=18$

7. 18

$y=18$

TAKE HOME QUIZ 2 – DUE ON MONDAY 14 MARCH. – ABSOLUTELY NO EXCEPTION!

1 A water trough is 15 m long and a cross – section has the shape of an isosceles trapezoid that is 40 cm wide at the bottom, 60 cm wide at the top, and has height 60 cm. If the trough is being filled with water at the rate of $0.3 \text{ m}^3/\text{min}$, how fast is the water level rising when the water is 55 cm deep? Round the result to the nearest hundredth.

- a. 3.48 cm/min
- b. 3.23 cm/min
- c. 2.36 cm/min
- d. 13.53 cm/min
- e. 3.43 cm/min
- f. 3.53 cm/min

2 Find the absolute minimum value of

$$y = 10x^2 + \frac{20}{x}$$

on the interval $\left[\frac{1}{2}, 20 \right]$.

3 Find the critical numbers of the function.

$$F(x) = x^{\frac{4}{5}} (x - 2)^2$$

4 A man starts walking north at 7 ft/s from a point P. Five minutes later, a woman starts walking south at 2 ft/s from a point 500 ft due east of P. At what rate are the people moving apart 10 min after the woman starts walking? Round the result to the nearest hundredth.

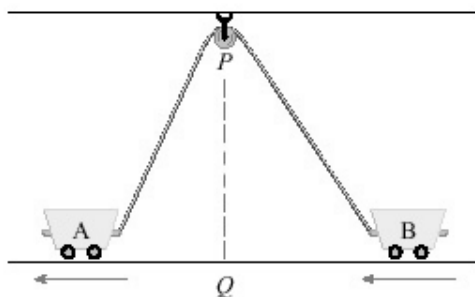
- a. 6.98 ft/s
- b. 8.98 ft/s
- c. 9.08 ft/s
- d. 9.99 ft/s
- e. 8.97 ft/s
- f. 9.01 ft/s

Name: _____

Class: _____

Date: _____

- 5 Two carts, A and B, are connected by a rope 40 ft long that passes over a pulley (see the figure below). The point Q is on the floor 16 ft directly beneath and between the carts. Cart A is being pulled away from Q at a speed of 3 ft/s. How fast is cart B moving toward Q at the instant when cart A is 7 ft from Q? Round the result to the nearest hundredth.



- 2.72 ft/s
 - 2.21 ft/s
 - 1.51 ft/s
 - 1.71 ft/s
 - 1.72 ft/s
 - 1.64 ft/s
- 6 Find the absolute maximum of the function

$$f(x) = \sin 10x + \cos 10x$$

on the interval $\left[0, \frac{\pi}{30}\right]$.

- 7 A plane flying with a constant speed of 360 km/h passes over a ground radar station at an altitude of 2 km and climbs at an angle of 30° . At what rate is the distance from the plane to the radar station increasing a minute later? Round the result to the nearest integer if necessary.
- 350 km/h
 - 351 km/h
 - 347 km/h
 - 348 km/h
 - 360 km/h
 - 349 km/h

ANSWER KEY

takehome2 – Answers For B

1. e

$$y(1)=30$$

2. 30

$$y=30$$

3. $2, \frac{4}{7}, 0$

4. b

7. f

5. d

6. $\sqrt{2}$
 $f=\sqrt{2}$

TAKE HOME QUIZ 2 – DUE ON MONDAY 14 MARCH. – ABSOLUTELY NO EXCEPTION!

1 A plane flying with a constant speed of 360 km/h passes over a ground radar station at an altitude of 3 km and climbs at an angle of 30° . At what rate is the distance from the plane to the radar station increasing a minute later? Round the result to the nearest integer if necessary.

- a. 339 km/h
- b. 338 km/h
- c. 341 km/h
- d. 340 km/h
- e. 342 km/h
- f. 351 km/h

2 Find the critical numbers of the function.

$$F(x) = x^{\frac{4}{5}}(x - 3)^2$$

3 A man starts walking north at 5 ft/s from a point P. Five minutes later, a woman starts walking south at 4 ft/s from a point 500 ft due east of P. At what rate are the people moving apart 10 min after the woman starts walking? Round the result to the nearest hundredth.

- a. 8.98 ft/s
- b. 10 ft/s
- c. 8.99 ft/s
- d. 6.99 ft/s
- e. 9.09 ft/s
- f. 9.02 ft/s

Name: _____

Class: _____

Date: _____

4 A water trough is 10 m long and a cross – section has the shape of an isosceles trapezoid that is 30 cm wide at the bottom, 60 cm wide at the top, and has height 60 cm. If the trough is being filled with water at the rate of $0.7 \text{ m}^3/\text{min}$, how fast is the water level rising when the water is 55 cm deep? Round the result to the nearest hundredth.

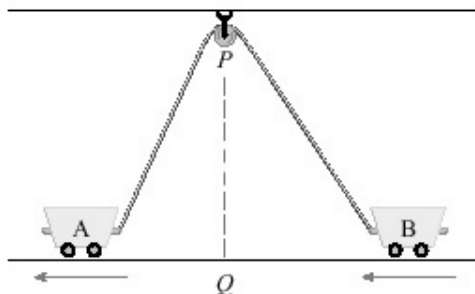
- a. 12.22 cm/min
- b. 11.97 cm/min
- c. 11.1 cm/min
- d. 12.27 cm/min
- e. 12.17 cm/min
- f. 22.27 cm/min

5 Find the absolute maximum of the function

$$f(x) = \sin 4x + \cos 4x$$

on the interval $\left[0, \frac{\pi}{12}\right]$.

6 Two carts, A and B, are connected by a rope 39 ft long that passes over a pulley (see the figure below). The point Q is on the floor 16 ft directly beneath and between the carts. Cart A is being pulled away from Q at a speed of 4 ft/s. How fast is cart B moving toward Q at the instant when cart A is 3 ft from Q? Round the result to the nearest hundredth.



- a. 0.84 ft/s
- b. 2.05 ft/s
- c. 1.54 ft/s
- d. 1.05 ft/s
- e. 0.97 ft/s
- f. 1.04 ft/s

Name: _____

Class: _____

Date: _____

(copy C)

7 Find the absolute minimum value of

$$y = 10x^2 + \frac{20}{x}$$

on the interval $\left[\frac{1}{2}, 20 \right]$.

ANSWER KEY

takehome2 – Answers For C

1. d

4. e

$y(1)=30$
7. 30
 $y=30$

2. $3, \frac{6}{7}, 0$

5. $\sqrt{2}$
f = $\sqrt{2}$

3. c

6. f