

CALCULUS MPT ANSWERS TO SAMPLE QUESTIONS

Sample questions are taken from the *Video Tutor* and [Video Tutor Guide](#), which is a set of DVD videos and its accompanying workbook that together cover the content of a precalculus course. Each answer given below is followed by a reference to the specific video containing the detailed solution to the question. These videos also provide comprehensive instruction on the underlying concepts as well as related practice problems.

The *Video Tutor* and *Video Tutor Guide* are available in the First Floor Media Video area of the Capilano University Library (QA 154.2 M858 1992). If you have difficulty finding them, please ask Library staff for help. If you do not have a DVD player, you can borrow one at the Library. The video links below lead to the CapU Library catalogue entry for the video, not the video itself.

Algebra

1. $\frac{-x^2}{x^2 - y^2}$ [Video 1.6.2](#)

2. $\frac{5}{(x+h+5)(x+5)}$ [Video 1.6.3](#)

3. $2x^2y^2 \sqrt[3]{2y^2}$ [Video 1.7.2](#)

4. $\frac{y-x}{xy}$ [Video 1.8.1](#)

5. $\frac{7x+3}{6x^{1/2}(x+1)^{1/3}}$ [Video 1.8.2](#)

6. $\frac{3}{\sqrt{2+3(x+h)} - \sqrt{2+3x}}$ [Video 1.7.2](#)

7. Volume = $(x+1)(6-2x)(9-2x)$ [Video 1.4.4](#)

Equations and Inequalities

8. (a) $x = \frac{ab+bc}{2c^2+ac+c-a^2}$ [Video 2.1.3](#)

(b) $x = 0$ or $x = 5$ [Video 2.3.1](#)

(c) $x = 1$ or $x = -\frac{1}{2}$

[Video 2.4.1](#)

(d) $x = 8$

[Video 2.4.1](#)

(e) $x = 2$, $x = -2$, $x = \sqrt{2}$, or $x = -\sqrt{2}$

[Video 2.4.2](#)

(f) $x < -\frac{4}{5}$ or $x > 4$

[Video 2.6.3](#)

(g) $x = -3$ or $x \geq \frac{3}{2}$

[Video 2.7.1](#)

(h) $x < \frac{1}{2}$ or $x \geq 2$

[Video 2.7.2](#)

9. $y = -\frac{1}{5}x + \frac{17}{5}$

[Video 3.2.3](#)

10. $x = \frac{-55 + 5\sqrt{161}}{2} \approx 4.22$ m.

[Video 2.3.4](#)

Functions

11. (a) $f(3x) = 5 + \frac{3}{6x+1}$

[Video 3.3.2](#)

(b) $3f(x) = 15 + \frac{9}{2x+1}$

(c) $f(x+h) = 5 + \frac{3}{2x+2h+1}$

(d) $\frac{f(x+h) - f(x)}{h} = \frac{-6}{(2x+2h+1)(2x+1)}$

12. $x < -3$ or $x \geq -\frac{1}{2}$

[Video 3.3.3](#)

13. Area = $\frac{\sqrt{3}}{4}x^2$

[Video 3.3.3](#)

14. (a) $x < 8$

[Video 3.3.4](#)

(b) $y > -2$

(c) $f(2) = 1$

(d) $f(0) = \frac{8}{3}$

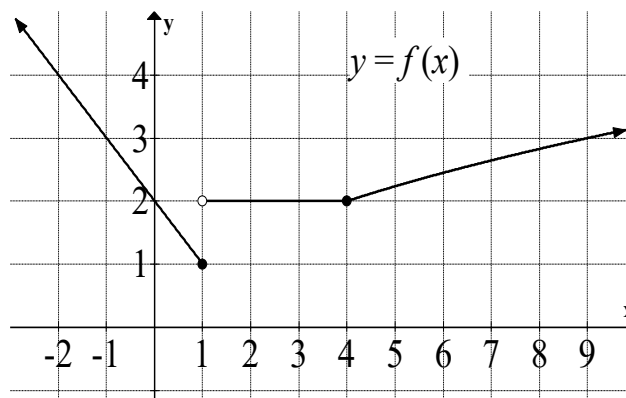
(e) $f(-2) = 1$

15. (a) all real numbers.

[Video 3.4.4](#)

(b) $y \geq 1$

(c)



16. (a) $(f \circ g)(x) = \frac{\sqrt{x+2}}{\sqrt{x+2}-3}$

[Video 3.6.2](#)

(b) $(g \circ f)(x) = \sqrt{\frac{x}{x-3}} + 2$

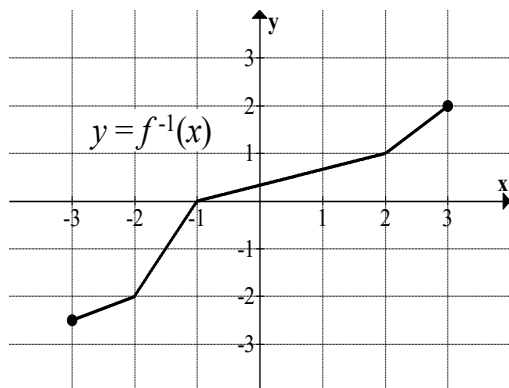
(c) Domain of $f \circ g$: $x \geq -2$ and $x \neq 7$

(d) Domain of $g \circ f$: $x > 3$ or $x \leq 2$

17. $f^{-1}(x) = 7 - (x-4)^2$, $x \geq 4$.

[Videos 3.7.1 – 3.7.4](#)

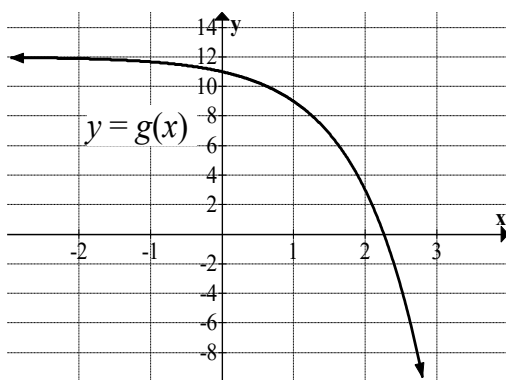
18.



[Videos 3.7.1 – 3.7.4](#)

Exponentials and Logarithms

19.



[Video 5.1.2](#)

20. $e^{2x} + e^{-2x} + 2$

[Video 5.2.1](#)

21. $x = 1 + \sqrt{2}$

[Video 5.3.3](#)

22. $x < -3$ or $x > \frac{5}{2}$

[Video 5.4.1](#)

23. $f^{-1}(x) = 3 - \ln(x - 2)$

[Video 5.4.2](#)

24. $\ln(2) + 3x + 1$

[Video 5.4.2](#)

25. $x = 0$ or $x = \ln(3)$

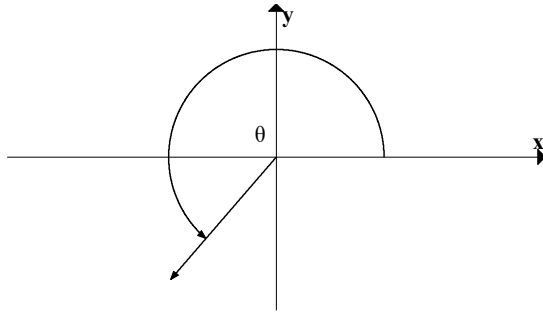
[Video 5.5.1](#)

26. \$36,000

[Video 5.5.2](#)

Trigonometry

27.



[Videos 6.1.1 – 6.1.3](#)

28. $\cos(\theta) = -\frac{1}{\sqrt{5}}$

$$\sin(\theta) = \frac{2}{\sqrt{5}}$$

$$\tan(\theta) = -2$$

[Video 6.2.3](#)

29. (a) $\cos(90^\circ) = 0$

(b) $\sin\left(\frac{\pi}{2}\right) = 1$

(c) $\sec(\pi) = -1$

[Video 6.2.4](#)

30. (a) $10 \tan(40^\circ) \approx 8.4$ m.

(b) Distance = $10 \tan(\theta)$

[Video 6.3.2](#)

31. (a) Quadrant III

(b) $\sin(\theta) = -\frac{2}{\sqrt{5}}$ and $\cos(\theta) = -\frac{1}{\sqrt{5}}$.

[Video 6.5.1](#)

32. $\sin(x)\cos(x)$

[Video 6.5.2](#)

33. The graph of $y = \sin(x)$ is stretched vertically by a factor of 3 and compressed horizontally by a factor of 4 to give the graph of $y = 3\sin(4x)$.

[Video 6.6.3](#)

34. $x = \frac{\pi}{6}$ or $x = \frac{5\pi}{6}$

[Video 7.6.1](#)