

# PRECALCULUS MPT

## ANSWERS TO SAMPLE QUESTIONS

Sample questions are taken from the *Video Tutor* and *Video Tutor Guide*, which is a set of videos and its accompanying workbook that together cover the content of an intermediate algebra 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 A/V section of the Capilano University Library (QA 154.2 M858 1992 ) and in the Mathematics Learning Centre (BR 289).

### *Introduction to Algebra*

1.  $y = 2x - 6$  Video 1.1.1
2. False. In fact,  $(a - b) - c = a - (b + c)$  Video 1.1.2
3. \$37.44 Video 1.1.3

### *Polynomials*

4.  $11x - 6y + 11$  Video 1.4.2
5.  $-4u^6v^{12}w^{20}$  Videos 1.4.3, 1.4.4
6.  $15x^3 + 22x^2 + 13x + 4$  Videos 1.4.3, 1.4.4
7. Quotient:  $-\frac{3}{2}x^2 + \frac{3}{4}x + \frac{1}{8}$  Video 4.3.1  
Remainder:  $\frac{55}{8}$  Ignore reference to functions.
8. (a)  $-3y(4y+1)(4y-1)$  or  $3y(1+4y)(1-4y)$  Videos 1.5.1, 1.5.2  
(b)  $(3x+1)(x+1)$   
(c)  $(5y^2+2)(y+2)(y-2)$

### *Rational Expressions*

9. (a)  $\frac{3x-1}{x-5}$  Video 1.6.1

$$(b) \frac{(x+1)^3}{(x-1)(x^2+1)} \text{ or } \frac{x^3+3x^2+3x+1}{x^3-x^2+x-1}$$

$$(c) \frac{x+3}{x-5}$$

10. (a) 1

Video 1.6.2

$$(b) \frac{9xy+9y+x}{3y(x+2)}$$

$$(c) \frac{x-3}{(x+1)(x+3)}$$

11. (a)  $\frac{2x}{(x+2)^2}$

Video 1.6.3

$$(b) -x(x+1)^2$$

### ***Radicals and Rational Exponents***

12. (a) 7

Video 1.7.1

(b) -0.5

13.  $2xy\sqrt[3]{x^2y}$

Video 1.7.2

14.  $x+2\sqrt{xy}+y$

Video 1.7.2

15. (a)  $\frac{5\sqrt[3]{49}}{14}$

Video 1.7.2

(b)  $\frac{a+2\sqrt{3a}+3}{a-3}$

16. (a) 1

Video 1.8.1

(b)  $\frac{(a^2+b^2)^2}{a^2b^2}$

(c)  $\frac{1}{x^8}$

(d)  $\frac{2y^2-x^3}{x^4y^2+x^3y}$

(e)  $\frac{a^2b^2}{a^2+3b^2}$

## Equations and Inequalities

17. (a)  $x = \frac{2}{3}$  Videos 2.1.1–2.1.3  
(b)  $x = \frac{7}{2}$   
(c)  $x = -\frac{1}{12}$   
(d)  $x = -4$   
(e)  $x = -6$   
(f)  $x = \frac{ab + bc}{2c^2 + ac + c - a^2}$
18. Width = 60 ft. Length = 150 ft. Videos 2.2.1 – 2.2.3
19. 750 ml of 5% butterfat milk and 250 ml of 1% butterfat milk. Videos 2.2.1 – 2.2.3
20. 10.25 km Videos 2.2.1 – 2.2.3
21. (a)  $x = 0$  or  $x = -\frac{2}{3}$  Videos 2.3.1 – 2.3.3  
(b)  $x = 6$  or  $x = 1$   
(c)  $x = 2$  or  $x = -\frac{5}{3}$   
(d)  $x = \frac{7 \pm \sqrt{73}}{6}$   
(e)  $x = -9$
22. Dimensions:  $25 - 5\sqrt{17}$  cm by  $25 + 5\sqrt{17}$  cm. Video 2.3.4
23. (a)  $x = 1$  or  $x = -\frac{1}{2}$  Videos 2.4.1, 2.4.2  
(b) No solutions  
(c)  $x = 8$   
(d)  $x = 1$ ,  $x = -1$ ,  $x = \frac{\sqrt{6}}{3}$ , or  $x = -\frac{\sqrt{6}}{3}$
24. (a)  $x < 17$  Videos 2.5.1, 2.5.2,  
(b)  $x = 6$  or  $x = -9$  2.6.1 & 2.6.2  
(c)  $x < -\frac{4}{5}$  or  $x > 4$

## Geometry

25.  $\sqrt{10}$  Video 3.1.1
26.  $(x+1)^2 + (y-4)^2 = 9$  Video 3.1.2
27. Centre :  $\left(\frac{5}{2}, -1\right)$ , radius :  $\frac{\sqrt{29}}{2}$  Video 3.1.2
28.  $L_1: y = x$  Videos 3.2.1 – 3.2.3  
 $L_2: y = \frac{1}{3}x$   
 $L_3: y = -x$
29.  $y = \frac{1}{3}x - \frac{1}{3}$  Videos 3.2.1 – 3.2.3
30. Line D is parallel. Line A is perpendicular. Videos 3.2.1 – 3.2.3
31. Lines C and E are parallel. Line B is perpendicular. Videos 3.2.1 – 3.2.3
32. Area =  $\frac{\sqrt{3}}{4}x^2$  Video 1.3.1
33. Area =  $\frac{3\sqrt{3}}{2}x^2$  Video 1.3.1