

## TEST 1, FORM A

$$\begin{aligned}
 1. \text{ Speed} &= \left( \frac{\text{distance}}{\text{revolution}} \right) \left( \frac{\text{no. of revolutions}}{\text{minute}} \right) \\
 &= \left( \frac{2\pi(50) \text{ cm}}{\text{rev}} \right) \left( \frac{30 \text{ rev}}{\text{min}} \right) \\
 &= 3000\pi \frac{\text{cm}}{\text{min}}
 \end{aligned}$$

$$\begin{aligned}
 2. \frac{\text{rev}}{\text{min}} &= \left( \frac{\text{distance/time}}{\text{distance/revolution}} \right) \\
 &= \left( \frac{50 \text{ ft/min}}{2\pi \text{ ft/rev}} \right) \\
 &= \frac{25 \text{ rev}}{\pi \text{ min}}
 \end{aligned}$$

$$\begin{aligned}
 3. \sin^2 \frac{\pi}{3} + \tan \frac{\pi}{4} &= \left( \frac{\sqrt{3}}{2} \right)^2 + 1 \\
 &= \frac{3}{4} + 1 \\
 &= \frac{7}{4}
 \end{aligned}$$

$$\begin{aligned}
 4. \csc 30^\circ - \sec^2 \frac{\pi}{6} &= \frac{1}{\sin 30^\circ} - \frac{1}{\cos^2 \frac{\pi}{6}} \\
 &= \frac{1}{\left(\frac{1}{2}\right)} - \frac{1}{\left(\frac{\sqrt{3}}{2}\right)^2} \\
 &= 2 - \frac{4}{3} \\
 &= \frac{2}{3}
 \end{aligned}$$

$$\begin{aligned}
 5. (\cos^2 \theta)(\sec \theta)(\tan \theta) &= (\cos^2 \theta) \left( \frac{1}{\cos \theta} \right) \left( \frac{\sin \theta}{\cos \theta} \right) \\
 &= \sin \theta
 \end{aligned}$$

$$6. \frac{(\cot \theta)(\cos \theta)}{\csc \theta} = \frac{\left( \frac{\cos \theta}{\sin \theta} \right)(\cos \theta)}{\left( \frac{1}{\sin \theta} \right)} = \cos^2 \theta$$

7. The contrapositive of "If p, then q" is "If not q, then not p." Contrapositive: **"If it is not raining, then there are no clouds in the sky."**

8. Write the contrapositive of the major premise: "If it is not raining, then there are no clouds in the sky." It is not raining, hence, there are no clouds in the sky.  
**Valid.**

$$\begin{aligned}
 9. 3y &= 2x - 3 \\
 y &= \frac{2}{3}x - 1
 \end{aligned}$$

The coefficient of  $x$  is the slope. Any line parallel to this line will have the same slope.

$$y - 1 = \frac{2}{3}(x - 3)$$

$$\begin{aligned}
 10. (2x^2 - 3x + 1)(3x + 1) \\
 &= 6x^3 - 9x^2 + 3x + 2x^2 - 3x + 1 \\
 &= 6x^3 - 7x^2 + 1
 \end{aligned}$$

$$\begin{aligned}
 11. x^2 + x &= 1 \\
 x^2 + x - 1 &= 0 \\
 x &= \frac{-1 \pm \sqrt{1^2 - 4(1)(-1)}}{2(1)} = \frac{-1 \pm \sqrt{5}}{2}
 \end{aligned}$$

$$12. \frac{1}{1 + \frac{1}{1 + \frac{1}{2}}} = \frac{1}{1 + \frac{2}{3}} = \frac{1}{\left(\frac{5}{3}\right)} = \frac{3}{5}$$

$$\begin{aligned}
 13. 3\sqrt{\frac{1}{3}} - 3\sqrt{3} + \sqrt{27} &= \sqrt{9}\sqrt{\frac{1}{3}} - 3\sqrt{3} + \sqrt{9 \cdot 3} \\
 &= \sqrt{\frac{9}{3}} - 3\sqrt{3} + \sqrt{9}\sqrt{3} \\
 &= \sqrt{3} - 3\sqrt{3} + 3\sqrt{3} \\
 &= \sqrt{3}
 \end{aligned}$$

$$\begin{aligned}
 14. \frac{2i - 4}{1 + i} &= \left( \frac{2i - 4}{1 + i} \right) \left( \frac{1 - i}{1 - i} \right) \\
 &= \frac{2i - 4 - 2i^2 + 4i}{1 - i^2} \\
 &= \frac{-2 + 6i}{2} \\
 &= -1 + 3i
 \end{aligned}$$

$$\begin{aligned}
 15. \sum_{i=-1}^1 (1 - 2^i) \\
 &= (1 - 2^{-1}) + (1 - 2^0) + (1 - 2^1) \\
 &= \left(1 - \frac{1}{2}\right) + (1 - 1) + (1 - 2) \\
 &= -\frac{1}{2}
 \end{aligned}$$

$$\begin{aligned}
 16. m\angle BPA &= \frac{1}{2}(\widehat{mAB} - \widehat{mBC}) \\
 2x &= \frac{1}{2}[(5x + 50) - (3x + 30)] \\
 2x &= \frac{1}{2}(2x + 20) \\
 2x &= x + 10 \\
 x &= 10
 \end{aligned}$$

$$\begin{aligned}
 17. 5x - 20 &= (2x) + (2x + 10) \\
 5x - 20 &= 4x + 10 \\
 x &= 30
 \end{aligned}$$

# *Calculus*

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## *Testing Schedule*

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<b>Test to be administered:</b>	<b>Covers material up through:</b>	<b>Give after teaching:</b>
Test 1	Lesson 2	Lesson 6
Test 2	Lesson 6	Lesson 10
Test 3	Lesson 10	Lesson 14
Test 4	Lesson 14	Lesson 18
Test 5	Lesson 18	Lesson 22
Test 6	Lesson 22	Lesson 26
Test 7	Lesson 26	Lesson 30
Test 8	Lesson 30	Lesson 34
Test 9	Lesson 34	Lesson 38
Test 10	Lesson 38	Lesson 42
Test 11	Lesson 42	Lesson 46
Test 12	Lesson 46	Lesson 50
Test 13	Lesson 50	Lesson 54
Test 14	Lesson 54	Lesson 58
Test 15	Lesson 58	Lesson 62
Test 16	Lesson 62	Lesson 66
Test 17	Lesson 66	Lesson 70
Test 18	Lesson 70	Lesson 74
Test 19	Lesson 74	Lesson 78
Test 20	Lesson 78	Lesson 82
Test 21	Lesson 82	Lesson 86
Test 22	Lesson 86	Lesson 90
Test 23	Lesson 90	Lesson 94
Test 24	Lesson 94	Lesson 98
Test 25	Lesson 98	Lesson 102
Test 26	Lesson 102	Lesson 106
Test 27	Lesson 106	Lesson 110
Test 28	Lesson 110	Lesson 114
Test 29	Lesson 114	Lesson 114

- The wheel on Michelle's unicycle revolved 30 times every minute as she rode down the straight path. If the radius of the wheel of her unicycle was 50 centimeters, how fast was Michelle's unicycle traveling along the path in centimeters per minute?
- The wagon was pulled down the road at a speed of 50 feet per minute. If the radius of each of the wheels of the wagon was 1 foot, how many revolutions were each of the wheels making per minute?

Evaluate:

3.  $\sin^2 \frac{\pi}{3} + \tan \frac{\pi}{4}$

4.  $\csc 30^\circ - \sec^2 \frac{\pi}{6}$

Simplify:

5.  $(\cos^2 \theta)(\sec \theta)(\tan \theta)$

6.  $\frac{\cot \theta \cos \theta}{\csc \theta}$

- Write the contrapositive of the statement: "If there are clouds in the sky, then it is raining."
- Is the following argument valid? Explain your answer.  
If there are clouds in the sky, then it is raining.  
It is not raining.  
Thus, there are no clouds in the sky.
- Write the point-slope form of the equation of the line which passes through (3, 1) and is parallel to the line  $3y = 2x - 3$ .
- Multiply  $2x^2 - 3x + 1$  by  $3x + 1$  and then simplify.
- Find the values of  $x$  which satisfy the equation  $x^2 + x = 1$ .

Simplify:

12.  $\frac{1}{1 + \frac{1}{1 + \frac{1}{2}}}$

13.  $3\sqrt{\frac{1}{3}} - 3\sqrt{3} + \sqrt{27}$

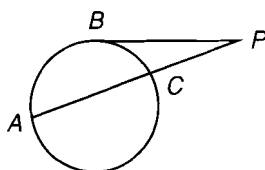
14. Write  $\frac{2i - 4}{1 + i}$  as a fraction whose denominator is a rational number.

15. Evaluate:  $\sum_{i=-1}^1 (1 - 2^i)$

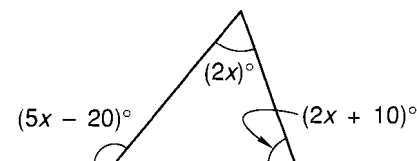
**Concept Review:**

Find  $x$  in the following drawings:

16.  $m\widehat{AB} = (5x + 50)^\circ$   
 $m\widehat{BC} = (3x + 30)^\circ$   
 $m\angle BPA = (2x)^\circ$



17.



# Calculus

## First Edition

### Problem Set Even Answers

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**problem set A**    2.  $C$     4.  $A$     6.  $\frac{a(a^2 + 2)}{a^2 + 1}$     8.  $\frac{x(xy^2 + m^2 + 1)}{y(1 + m^2)}$     10.  $4 + 3i$     12.  $\frac{10}{17} + \frac{11}{17}i$   
14.  $m^{(6+x)/3}b^{(5x-4)/2}$     16.  $x = 1, y = -2, z = 2$     18.  $ab^{2x+1}(ab - 1)$   
20.  $(xy^2 + 2m^4)(x^2y^4 - 2xy^2m^4 + 4m^8)$     22.  $12$

**problem set B**    2.  $y = 5$     4.  $\frac{x}{-1} + \frac{3y}{2} = 1$     6.  $x = -1$  and  $\frac{3}{2}$     8.  $2x^2 + 6x + 15 + \frac{50}{x-3}$   
10.  $\frac{3(dbck^2 + 6y)}{d}$     12.  $\frac{7}{10} + \frac{1}{10}i$     14.  $y^{3a-1}z^{11a/3-2}$     16.  $x = 1, y = 2, z = 1$   
18.  $x^3y^6(1 - 2xy^2)(1 + 2xy^2 + 4x^2y^4)$     20.  $8$     22.  $D$     24.  $x = 3$

**problem set 1**    2. Invalid    4. not  $p$ ; use the contrapositive    6.  $y = -2x + 6$     8.  $(x + 3)^2 + 4 = 0$   
10.  $y = 1 + \sqrt{3}$  and  $x = 2 + \sqrt{3}$  or  $y = 1 - \sqrt{3}$  and  $x = 2 - \sqrt{3}$   
12.  $R_1 = \frac{acR_2}{R_2k(m+b) - bc}$     14.  $\frac{3}{74} - \frac{19}{74}i$     16.  $x^3y^{11/4}$     18.  $\frac{m(m-y)}{x(m-y) + pm}$   
20.  $x(2x - 1)(x + 2)$     22.  $10$     24.  $D$     26.  $x = 7$

**problem set 2**    2.  $\frac{50}{\pi}$  rev/min    4.  $\frac{10}{3}$     6.  $\frac{8 - \sqrt{2}}{2}$     8.  $\sin^2 \theta$     10. Valid    12.  $-5$  and  $\frac{3}{2}$   
14.  $6x^3 - 11x^2 + 14x - 5$     16.  $r = \frac{r_1 r_2}{v(r_1 + r_2)}$     18.  $-2\sqrt{5} + 5\sqrt{2}$     20.  $x - y$   
22.  $x = 10$     24.  $D$

**problem set 3**    2. 40 days    4. \$9 million    6.  $120\pi$  ft/min    8.  $\frac{8}{3}$     10.  $\sin x \cos x$     12. Valid  
14.  $x = 2$     16.  $y = x^4 - 1$     18.  $5 + 2\sqrt{6}$     20.  $\frac{4(x-1)}{m(x-1) + a}$     22.  $A$     24.  $x = 48$

**problem set 4**    2. 24 sophists, 8 pundits, 2 charlatans    4.  $32\frac{8}{11}$  minutes    6.  $b$     8.  $b$   
10. Domain =  $\{x \in \mathbb{R} \mid x \geq 1\}$ ; range =  $\{y \in \mathbb{R} \mid y \geq 0\}$     12.  $-1$     14.  $\frac{1}{4}$     16.  $1$   
18.  $-1$     20.  $\frac{13}{3}$     22.  $A$     24.  $x = 60$

**problem set 5**    2.  $2$     4. 17 mph    6.  $\left(\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$     8.

