Name: _____     Date: _____

Chapter 2 Review

For each type of question, the achievement level is indicated.  Showing work is an important strategy in communicating your knowledge and ideas so please be thorough.

| **Learning Goal 2.1** | Using angles in standard position and relating them to special angle triangles, the unit circle, reference and co-terminal angles and the terminal arm. |
|---|---|

| Developing |
|---|
| 1.  Draw the two special angle triangles. |

| Developing | | | | | |
|---|---|---|---|---|---|
| 2.  Determine the quadrant in which the terminal arm of each angle in standard position lies. | | | | | |
| a. | 280° | b. | 88° | c. | 191° |
| d. | 103° | e. | 387° | f. | 267° |
| g. | $-128°$ | h. | $-23°$ | i. | 460° |
| **Proficient** | | | | | |
| 3.  Find the reference angle of each angle and sketch the angle in standard position. | | | | | |
| a. | 280° | b. | 88° | c. | 191° |
| d. | 103° | e. | 387° | f. | 267° |
| g. | $-128°$ | h. | $-23°$ | i. | 460° |

| Proficient | | | | | |
|---|---|---|---|---|---|
| 4.  For each angle, determine the other angles, $0 \leq \theta \leq 360$, that have the same reference angle. | | | | | |
| a. | 34° | b. | 98° | c. | 241° |
| d. | 290° | e. | 175° | f. | 191° |
| **Extending** | | | | | |
| g. | $-56°$ | h. | $-109°$ | i. | $-250°$ |
| j. | 473° | k. | 382° | l. | 567° |

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Chapter 2 Review

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| **Learning Goal 2.2** | Using trigonometric ratios and solving simple trigonometric equations. |
|---|---|

| Developing | | |
|---|---|---|
| 1. For the following coordinates on the terminal arm of an angle $\theta$, find the exact value of $\tan\theta$ and the value of $\theta$ to the nearest degree. | | |
| a.    $A(4,7)$ | b.    $B(3,4)$ | c.    $C(5,8)$ |
| **Proficient** | | |
| d.   $D(-4,8)$ | e.    $F(-2,5)$ | f.    $G(-9,3)$ |
| g.   $H(-3,-5)$ | h.    $J(-8,-3)$ | i.    $K(-4,-4)$ |
| j.    $M(6,-4)$ | k.    $N(3,-7)$ | l.    $P(7,-6)$ |

| Proficient | | |
|---|---|---|
| 2. For the following coordinates on the terminal arm of an angle $\theta$, find the exact value of $\sin\theta$ and $\cos\theta$. | | |
| a.    $A(4,7)$ | b.    $B(3,4)$ | c.    $C(5,8)$ |
| d.    $D(-4,8)$ | e.    $F(-2,4)$ | f.    $G(-9,3)$ |
| g.    $H(-3,-5)$ | h.    $J(-8,-3)$ | i.    $K(-4,-4)$ |
| j.    $M(6,-4)$ | k.    $N(3,-7)$ | l.    $P(7,-6)$ |

| Proficient | | |
|---|---|---|
| 3. Given the following information, find the exact value of the other two trigonometric ratios. | | |
| a.   $\cos\theta = -\dfrac{1}{4}$   $\theta \in III$ | b.   $\tan\theta = -\dfrac{3}{7}$   $\theta \in II$ | c.   $\sin\theta = -\dfrac{3}{4}$   $\theta \in IV$ |
| d.   $\cos\theta = \dfrac{2}{3}$   $\theta \in I$ | e.   $\tan\theta = \dfrac{8}{3}$   $\theta \in III$ | f.   $\sin\theta = \dfrac{3}{4}$   $\theta \in II$ |

| Developing | | |
|---|---|---|
| 4. Given the following equations, determine all possible quadrants that the terminal arm of the resulting angle lies. | | |
| a.   $\cos\theta = -\dfrac{3}{4}$ | b.   $\cos\theta = -\dfrac{4}{3}$ | c.   $\cos\theta = \dfrac{4}{5}$ |
| d.   $\sin\theta = -\dfrac{2}{5}$ | e.   $\sin\theta = \dfrac{3}{10}$ | f.   $\sin\theta = \dfrac{5}{2}$ |
| g.   $\tan\theta = \dfrac{12}{5}$ | h.   $\tan\theta = -\dfrac{2}{5}$ | i.   $\tan\theta = \dfrac{4}{5}$ |

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| Proficient |
|---|
| 5.  Given the following equations, find all possible values of $\theta$ to the nearest degree, when $0 \le \theta \le 360$. |

| a. $\cos \theta = -\dfrac{3}{4}$ | b. $\cos \theta = -\dfrac{1}{4}$ | c. $\cos \theta = \dfrac{4}{5}$ |
|---|---|---|
| d. $\sin \theta = -\dfrac{2}{5}$ | e. $\sin \theta = \dfrac{3}{10}$ | f. $\sin \theta = \dfrac{2}{5}$ |
| g. $\tan \theta = \dfrac{12}{5}$ | h. $\tan \theta = -\dfrac{2}{5}$ | i. $\tan \theta = \dfrac{4}{5}$ |

| Extending |
|---|
| 6.  Determine the exact value of $\cos 330°$.  Please include a diagram with your solution. |
| 7.  Determine the exact value of $\sin 240°$.  Please include a diagram with your solution. |
| 8.  Determine the exact value of $\tan 135°$.  Please include a diagram with your solution. |
| 9.  Solve for $\theta$, $\sin \theta = -1/\sqrt{2}$, where $-360° \le \theta < 0°$.  Please include a diagram with your solution. |
| 10. Solve for $\theta$, $\cos \theta = -1/2$, where $-180° \le \theta < 180°$.  Please include a diagram with your solution. |
| 11. Solve for $\theta$, $\tan \theta = 1/\sqrt{3}$, where $-360° \le \theta < 360°$.  Please include a diagram with your solution. |
| 12. Determine $\sin \theta$ of all the angles, $0° \le \theta \le 360°$ that have $30°$ as a reference angle. |

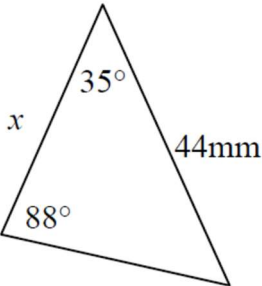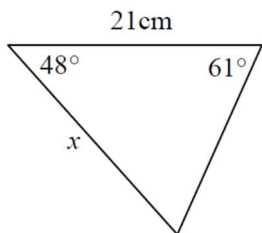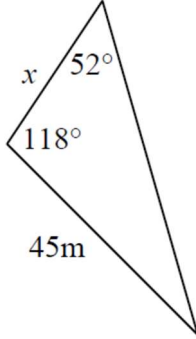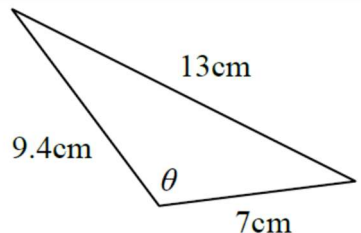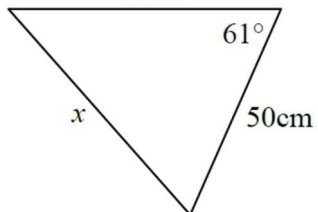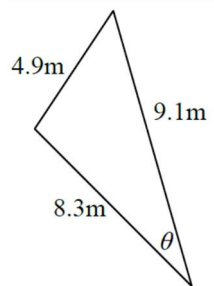| Extending |
|---|
| 13. Explain, to the best of your ability, why $\cos(90 - \theta) = \sin \theta$. |
| 14. Explain, to the best of your ability, when $\tan \theta = 0$ and why. |
| 15. Prove $\tan \theta = \dfrac{\sin \theta}{\cos \theta}$. |
| 16. A fire spotter sees smoke rising from a point that lies in a direction $E80°N$.  He estimates that the distance from his location is about 20 km.  The firefighters must travel east then north to get to the fire.  To the nearest kilometre, how far should the firefighters travel in each direction, to the nearest tenth of a kilometre? |

Chapter 2 Review

For each type of question, the achievement level is indicated.  Showing work is an important strategy in communicating your knowledge and ideas so please be thorough.

| **Learning Goal 2.3** | Use of sine and cosine laws to solve non-right triangles, including ambiguous cases. |
|---|---|

1. Solve for the unknown in each triangle, rounding all distances to the nearest tenth and all angles to the nearest degree.
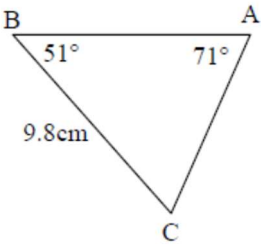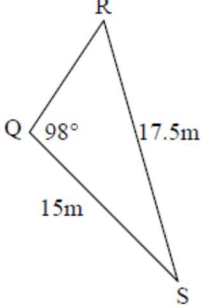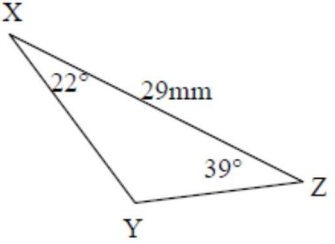
| Developing | | |
|---|---|---|
| a.  | b.  | c.  |
| d.  | e.  | f.  |
| **Proficient** | | |
| g. Find $z$ when $x = 29$ m, $y = 15$ m, and $\angle Z = 122°$ | h. Find $\angle C$ when $a = 26$ m, $b = 16$ m, $c = 21$ m and $\angle A = 88°$ | i. Find $\angle H$ when $g = 13$ cm, $h = 8$ cm, and $j = 15$ cm |
| j. Find $k$ when $l = 16$ m, $\angle M = 58°$ and $\angle K = 93°$ | k. Find $\angle N$ when $n = 31$ mm, $p = 28$ mm, and $\angle M = 62°$ | l. Find $\angle R$ when $p = 26$ m, $q = 24$ m, $r = 6$ m and $\angle P = 103°$ |

| Extending | | |
|---|---|---|
| m. Find $a$ when $b = 24$ cm, $c = 20$ cm, and $\angle C = 43°$ | n. Find $\angle Q$ when $r = 26$ km, $p = 25$ km and $\angle P = 70°$ | o. Find $\angle F$ when $f = 7$ cm, $g = 5$ cm, and $\angle G = 73°$ |
| p. Find $s$ when $t = 7$ mm, $u = 33$ mm, and $\angle U = 145°$ | q. Find $\angle Z$ when $x = 18$ m, $y = 9$ m and $\angle Y = 84°$ | r. Find $c$ when $a = 28$ ft, $b = 27$ ft, and $\angle B = 45°$ |

Chapter 2 Review

2. Solve the following triangles, rounding all distances to the nearest tenth and all angles to the nearest degree.

| Proficient | | |
|---|---|---|
| a.  | b.  | c.  |
| **Extending** | | |
| a. $a = 4$ m, $b = 11$ m and $c = 8$ m | b. $q = 23$ m, $p = 14$ m and $\angle Q = 105°$ | c. $h = 9$ km, $\angle F = 22°$ and $\angle H = 13°$ |